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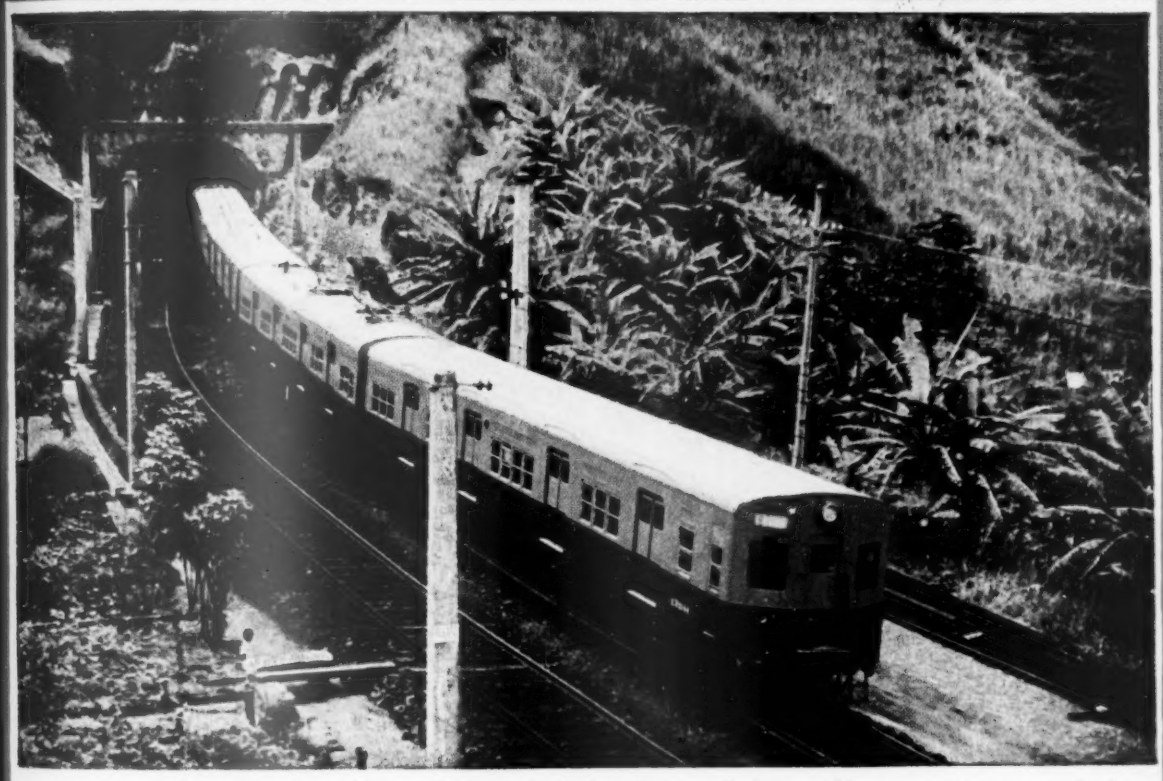

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British Electrification on View

WHEN the British Railways Electrification Conference takes place in London during the first week in October next year, delegates will not only have an opportunity to see the achievements of British Railways in a.c. electrification. They will also visit many of the works of foremost British manufacturers who are playing a large part in the electrification section of the railway modernisation plan. Agreement has now been reached as to the form these visits will take. During the week before, and the week after, the conference delegates will be invited to visit the works of a number of leading makers of railway equipment. To cope with the varying interests of the overseas engineers who will be attending the Conference it has been decided to divide these works visits into six principal categories. The locomotive industry will be one of these and delegates will have an opportunity of visiting a number of works and seeing the latest developments in locomotive building. The second group of visits will be provided by the carriage and wagon building industry. The third will comprise a number of the most important works devoted to the electrical industry. Railway brakes, signals and allied accessories will form a group on their own, and so will the makers of overhead equipment, which will include cables and telecommunications. Finally, there will be a general group under the heading of ancilliary railway equipment and accessories. Delegates will be circularised with details of these visits and will have an opportunity of selecting those which make the most direct personal appeal to the individual. It is proposed to commence these series of visits from September 26 and to end them on October 14. They will not take place during the period of the conference. There is no doubt that the works visits will foster interest in the considerable achievements and skill of the British electric traction and railway supply industries which have been demonstrated not only in this country but also on many railways overseas.

The B.T.C. Backs Union Membership

LAST week, Sir Brian Robertson, Chairman of the British Transport Commission, drew the attention of all railway employees to "the desirability of trade union membership." He said that the Commission attached great importance to being able to settle with the railway unions all matters which had a bearing on employees' interests: he acknowledged the union's help and co-operation in dealing with the industry's problems and said that it was the Commission's policy to facilitate and encourage union membership among the staff. While joining a union was a matter for individual decision, all staff should note the desirability of trade union membership and the facilities given to the railway unions for expressing employees' views on everything affecting employment and welfare. The statement appears to be a return gesture to the National Union of Railwaymen for resuming joint consultation. The membership of that union has been declining with the contraction of the railways and, although the number of railway employees who are not already in one of the three big unions is believed to be small, any additional membership would obviously be welcomed at the present time.

Improvement in Ghana Railway Finance

THE report for 1958-59 of the Ghana Railway & Harbours is in the course of preparation, but advance figures received from Mr. H. F. P. Plumridge, General Manager & Harbour Authority, show that the year was considerably better than the previous 12 months both for the Railway and the Administration as a whole. Before making provision for renewals, but after meeting charges in respect of police, medical, health and other services, and pensions contributions, the Administration as a whole made an operating surplus of £G1,312,434 to which the Railway contributed £G734,881, Takoradi Harbour £G510,708, and other ports £G66,845. The net surplus, after allowing for renewals and net revenue items amounted to £G310,363 of which the Railway contributed £G7,524. In 1957-58 the Railway suffered a heavy reduction in its operating surplus and after paying all charges showed a net deficit on the year of £G507,929. This unfavourable result was mainly due to the small cocoa crop which led to a drop in the tonnage railed of 24,226 tons and a corresponding decline in revenue of £G234,246. This year's figures more than account for that decline and should, therefore, give cause for some optimism.

Egyptian Developments

CLOSING of the Egyptian Delta Light Railways, the 2-ft. 6-in. gauge system owned and worked by the Government since 1953, was perhaps inevitable as plans for road building were implemented in the Nile Delta. The 600 route-miles are being closed to goods and passenger traffic in four stages. The freight capacity of the system was considerable, and movement of the cotton and other crops by road may not prove easy. On the Egyptian Republic Railways, which are mainly standard gauge, the principal development since electrification of the Cairo-Helwan suburban line at 1,500V. d.c. in 1956, is stated to be the growth of road collection and delivery services for containers, "smalls," and parcels traffic. The extent of diesel traction is shown by the number of main-line diesel-electric locomotives, given recently as 57, and that of diesel shunting locomotives, 117, compared with 627 steam engines. The number of diesel railcars is 63. No further electrification schemes have been announced, though the Cairo suburban

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area appears to promise ample traffic. Hydro-electric power projects now being prepared may result in plans for railway electrification.

Five-year Plan for Hungarian Railways

ALTHOUGH the Hungarian industries supplying railway material have been busy with export orders, development of the Hungarian State Railways since the war has been slow, largely in introduction of diesel locomotives and multiple-unit trains. Before 1939 electrification had progressed as fast as availability of funds permitted. It included conversion at 16,000V., 50 cycles, of the main line from Budapest *via* Györ to the Austrian frontier at Hegyeshalom, 117 miles. The only major electrification since the war has been that from Budapest to Hatvan, 65 miles, on the same voltage. Several passenger stations have been rebuilt with, apparently, attention to passenger amenities rather than to traffic operation. The Government has announced a new five-year plan for the State Railways which necessitates construction of 100-110 electric and 380-400 diesel locomotives, and improvement of the track. It is not clear whether further electrification is intended. The new locomotives may be needed on existing electrified sections. Although the economy is Communist, a home market for the railway industries would be useful in several ways.

European Economic Co-operation

NOW that the " Outer Seven " countries are to form their own European Free Trade Area, the problems faced by British industry and commerce are urgent. Action may have to be taken on developments which cannot be precisely foreseen, such as the future of the European Free Trade Area, which may become a bridge or a barrier in its relations with the " Six " countries of the European Common Market. To promote knowledge of European economic integration, the Britain in Europe organisation was formed. Its members include leaders of industry, commerce, and the trade unions. The Chairman, Lord Salter, claims that the organisation is essential to exporting concerns, which must be prepared to adjust their policies quickly and perhaps also to make collective representations to the Government. The publication " Britain and Europe," a study of the likely effects of the Common Market on British industry, with or without a free trade area, has contributed much to the understanding of these problems. A second study " The Commonwealth and Europe" due to appear in March, is to show the consequences for British Commonwealth countries of European economic integration and free trade. Lord Salter maintains that the approach to European questions has suffered through inadequate and outdated knowledge of the economic bonds which link the Commonwealth and through failure to realise the changing importance of Commonwealth preference as such and the growing interest of Commonwealth countries in Europe.

Every Railwayman a Salesman

RAILWAYMEN in the smaller centres, and sometimes even in large cities and railway installations, have long tended to identify their own interests with those of the undertaking which affords them a livelihood. *Esprit de corps* has made them do all they can to further railway interests, not only in looking for business, but also in defence against unmerited criticism, and so on. Such a spirit is harder to engender in a large centre, though it often exists there. A good many, and not only those in official contact with the public, have looked hard for business. In the current issue of *British Railways Magazine*, the " Man on the Line " mentions among those whose duties involve dealings with actual and potential railway users, the goods and parcels collection and delivery man who picks up useful tips about firms which are expanding, new types of business, new products, and the activities of the railways' competitors. Whatever he notices he notes in his journal so that the railway sales staff can take appropriate action. Now that the pattern of industry is changing all over Britain, and many new potential consignors by rail — and potential users of " C "-licence vehicles—are coming into being, it is vital that all railwaymen realise where their true interests lie, keep their eyes and ears open for possible traffics, and report to the local agent or appropriate officer.

End of Coal Transport Subsidy in South Africa

THE levy paid since July 1, 1954, by the South African Railways to subsidise the transport of coal by road was discontinued on September 30, 1959, and now that the S.A.R. can carry by rail all coal offered for transport, the subsidy will cease altogether on December 31. Conveyance of coal by private road hauliers was started in 1954 when the Railways for various reasons could not make sufficient wagons available. Demands for wagons had reached a high level following on a period of unprecedented industrial development and agricultural expansion, while the modernisation programme was only just under way. Because the cost of road transport was higher than that of rail, a fund was established to subsidise private road hauliers. The S.A.R. contributed to the fund on the basis of all coal consumed by the railways if brought from the Transvaal and the Orange Free State collieries. From the fund a subsidy was paid to road hauliers on all coal conveyed by road to destinations on the Reef and Pretoria between 25 and 100 miles from the supplying colliery. The total quantity of coal carried by road amounted to 11,693,005 tons, while the S.A.R. paid £1,146,889 in levies.

Through Carriages

NOW that the remodelling of passenger services is being effected as diesel and electric traction is being introduced on British Railways, much thought is being given to through services. The tendency is to work fewer through coaches or portions. This saves time in attaching and detaching, and often economises in stock and simplifies working. The public tends to travel with less baggage, which minimises the inconvenience of changing, especially when across a platform—though the amount of baggage certainly necessitates better combined train-and-bus facilities. Many passengers and not a few communities desire at least one good through service daily to and from London or some other centre. The fact that multiple-unit trains, diesel and electric, can be divided into two or three portions means that they can provide regular interval through services. In the Southern Region, for instance, division and joining up of the Kent Coast electric expresses at Gillingham afford hourly services on the Ramsgate and Dover lines; and similar procedure at Tunbridge Wells Central enables some Hastings line diesel trains to give a feeder service to wayside stations south of Tunbridge Wells. The example of the Southern might well be followed by other Regions which introduce multiple-unit trains over longer distances.

The Origins of Route Setting

THE first practical application of the idea of route setting, now generally followed in power interlocking work, was made in 1903 at Bordeaux St. Jean to the designs of Théophile Ducousso, of the then firm of Postel-Vinay, and the Assistant Traffic Superintendent of the Chemins de fer du Midi, Gabriel Bleynie, himself a civil engineer. The signalling historian, Monsieur Charles Lecomte, who had given details of their careers in our contemporary *La Vie du Rail*, recently continued the story by relating the life of the Chief Engineer of the former Eastern Railway of France, Albert Descubes, who introduced the conception of what is now called the entrance and exit principle in his electro-mechanical apparatus. This was applied first to two signalboxes at Nancy in 1909. He then turned to purely electrical means of realising this idea and constructed many signalboxes on a modified system, involving the notion of " geographical " circuits. The largest was that at the rebuilt Gare de l'Est in Paris, where nine lines outside connected with 34 in the station itself. It contained 187 " handles " controlling 233 sets of points and 180 signals and able to deal with no fewer than 3,818 distinct traffic movements, running and shunting.

A Capsized Crane

THE accident on December 11, 1958, between Urmston and Trafford Park, arose from an incident occurring outside railway property, which led to a crane falling on the line. Our summary in this issue of Colonel W. P. Reed's report shows that the case presented many points of interest in view

of the many road works affecting the railway now being carried out. It is essential to ensure not only that contractors' workmen are protected from harm but also that, should something occur to endanger rail traffic, warning can be given with the minimum of delay. The weak points in organisation revealed by this accident have been appreciated fully by those concerned, and no doubt will be borne in mind carefully in future. Colonel Reed suggests that this class of connected road work should be brought under the jurisdiction of the Factory Inspectorate, already applicable to the bridge construction itself, so as to diminish certain types of risk. He proposes also that the railways examine afresh the question of using flares as a rapid means of giving warning in an emergency of an obstruction to rail traffic.

Treatment of Rails to Improve Adhesion

FOR practical railway design purposes the coefficient of adhesion between wheels and rails when free of moisture is normally taken as being about 0·25. According to the annual report for 1958 of the Mechanical Engineering Research Board of the Department of Scientific & Industrial Research, railway traction acceleration and braking conditions have been simulated at the National Engineering Laboratory at East Kilbride, Glasgow, under which the adhesion coefficient has been raised to 0·35. This figure has been achieved by applying to rail surfaces a solution of sodium metasilicate and detergents based on it, after contamination of the surfaces has been caused with organic substances such as lubricating oil, grease, oleic acid, or stearic acid. Sodium metasilicate was found to be slightly more effective when injected with steam than when applied in water. Its effectiveness is attributed to the alkalinity of the solution, for neutralisation with hydrochloric acid eliminated the beneficial effect. To obtain a high adhesion coefficient permanently the residue remaining after chemical treatment of the contaminated surfaces had to be removed. This can be done with either steam or water. The investigation was carried out at the request of the British Transport Commission and it now remains for the results to be tested operationally.

A Year of Progress

PROGRESS in implementing the plan as re-appraised, for modernisation and re-equipment of British Railways, notably in electrification and in the construction of marshalling yards, and slow improvement in mineral and merchandise receipts are the principal and more encouraging features of the year now ending.

The need to carry out electrification at 25kV., a.c., and many associated works to obtain clearances and improve signalling on an unprecedented scale and at a greatly accelerated rate has resulted from the putting forward to 1964 of the dates for completing electrification of the Western Division main lines of the London Midland Region. The ensuing complications include increasing the density—which in turn aggravates operating problems—of the traffic of the Western Region London-Birmingham and associated lines, over which pass services diverted to facilitate work on the London Midland lines.

Conversion of much of the Crewe-Manchester section has been completed and the first a.c. electric locomotive built for service in Britain, the Type "A" 3,300-h.p., of the Bo-Bo wheel arrangement, has been handed over by Associated Electrical Industries, after completion by the British Thomson-Houston Co. Ltd., now incorporated in the A.E.I. Traction Division. Other developments in high-tension electrification include completion of conversion of the Colchester-Clacton-Walton lines of the Eastern Region, and progress on conversion of London suburban sections of the Great Eastern Line and of the London Tilbury & Southend Line of the same Region, and of Glasgow suburban lines of the Scottish Region. Electric traction on the 750-V., third-rail system, was extended by the Southern Region from Gillingham to Ramsgate and Dover. Associated with this, apart from civil engineering and signalling works on the newly electrified lines, was the widening with re-arrangement of tracks and re-signalling, between London and Swanley. Progress is now being made on electrification from Sevenoaks via Ashford to Folkestone, Dover, and Ramsgate; also, on the L.T.E. Metropolitan Line, from Rickmansworth to Amersham at 600 V. d.c.

Delivery of main-line diesel locomotives continued. By the end of the year it is estimated that 500 will be in service. They are of a number of types and some of them built by private builders. Railcar deliveries have included units built at British Railways' Derby Works, with Rolls-Royce engines and torque converters. They are to work the accelerated St. Pancras-Bedford services to be introduced early in the new year. Five high-speed multiple-unit diesel Pullman sets of exceptional standards of comfort are under construction by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., for the St. Pancras-Manchester, Paddington-Birmingham-Wolverhampton and Paddington-Bristol services. Progress has been made on construction or conversion of premises for maintenance and repair of diesel locomotives and railcars, and on facilities for instructing enginemen and maintenance staff in diesel and electric techniques. Diesel multiple-unit trains were introduced on many routes, and diesel locomotives now work a large part of the traffic on several main lines.

Among marshalling yards, all incorporating electronic devices, Temple Mills, Eastern Region, was brought into use this year, and those under construction or partly in operation include Ripple Lane, Barking, in the Eastern; Margam, Port Talbot, in the Western; and Perth and Millerhill, Edinburgh, in the Scottish Regions. Because of the large amount of ancillary equipment needed to avoid interference from the high-voltage electrified lines, the Crewe-Manchester re-signalling was the most important of the schemes completed this year. Others were those associated with the extension of electrification and re-arrangement of tracks in the London area mentioned above, and the new route-relay interlocking box at Newcastle, North Eastern Region. Many new schemes are in progress at Birmingham Snow Hill, Western Region, and elsewhere.

Widening of the East Coast main line of the Eastern Region between New Barnet and Potters Bar, involving three new double-track tunnels built with pre-cast concrete segments manufactured on site, was the main civil engineering work completed. Most of the other work apart from station rebuilding is in connection with electrification. A good many passenger stations are being rebuilt or improved, among them Banbury, Barrow-in-Furness, Chichester, Leeds City, Manchester London Road, Plymouth North Road, and Weymouth.

The "Condor" overnight London-Glasgow "freight liner" container service, inaugurated by the London Midland and the Scottish Regions, is an entirely new feature of goods working. Many goods stations have been rebuilt, and mechanisation of freight handling continues.

Passenger and goods traffics, and more particularly merchandise and mineral traffics, were disappointing in the earlier and middle months of the year. The revival in the steel industry has augmented mineral receipts in recent weeks. The marked, if moderate, rise in merchandise receipts is due partly to the efforts being made by traffic staffs in the new organisations in the several Regions to take advantage of the freedom accorded in quoting rates. Coal traffic, as expected from the fall in demand for coal, has steadily declined. Passenger receipts have not risen greatly, and the effect of the fare increases from November 1 remain to be seen. They embody, in the new five-day off-peak season and the off-peak day return tickets, the principles of encouraging traffic out of rush hours, also tapering off the level of ordinary fares. The increase to 2½d. a mile of the second class fare up to 200 miles is well within the 3d. a mile "ceiling" for which the Commission had received authority. Improvements have been effected in passenger amenities including refreshment facilities in trains and at stations. The closing of unremunerative lines and stations has continued. To tide over the period before the hoped-for increased prosperity of the railways and its other undertakings puts it on a sound financial basis, the Commission was compelled earlier in the year to increase its borrowing powers, which was effected in the Transport (Borrowing Powers) Act of March 25. This increased the amount which could be borrowed to £1,200 million. Meanwhile, the Commission must pay interest on its previous borrowings. The working deficit of the Commission on a turnover of some £710 million in 1958 was £36,000,000. The loss on operating British Railways was £48 million. Receipts for the 48 weeks now elapsed of 1959 are £8,000,000 less than a year ago, as shown on

this page. The gap is being closed, but there is a long way to go before the situation can be considered to be healthy.

The general election in October brought a new Minister of Transport, Mr. Ernest Marples, as successor to Mr. Harold Watkinson, who had done much to represent British Railways' case to the Government and obtain Government backing for the modernisation plan. Mr. A. B. B. Valentine has succeeded Sir John Elliot as Chairman of London Transport Executive, with Mr. A. H. Grainger as Managing Director; Sir John Elliot retains his connection with transport as Chairman of Thos. Cook & Son Ltd. After service as Assistant General Manager of the Great Western Railway and Chief Regional Officer, and, later, General Manager of British Railways, Western Region, Mr. K. W. C. Grand was created a Member of the Commission. His successor at Paddington is Mr. J. R. Hammond. The concentration of effort on implementation of electrification and other plans for improvement has resulted in appointments in several Regions of officers with special responsibilities in this field.

In the industrial sphere a major event has been the completion by the Guillebaud Committee of its review of railway pay, to be published in March.

Lifting Crossing Barriers

STOUTLY constructed level crossing gates, with their road stops and other attachments, closing alternately across road and railway tracks and fencing the latter in accordance with a principle adopted over a century ago in the United Kingdom, remain a familiar sight and are to be found at times in other parts of the world where British practice came to be followed. Where such gates are worked from a signalbox and interlocked with the signals, accidents have been very rare. Even where a gateman only is on duty and there may even be no railway signals a good standard of safety generally has prevailed.

The changed character of road traffic, so different from that when these arrangements were adopted, with the ever-increasing costs of providing attendants and difficulty of obtaining competent ones and so on, has led those responsible gradually to consider the use of other methods of crossing protection, as described in the article in our issue for October 23. In some Continental countries gates, as understood in Great Britain, have never, or very seldom, been used, and lifting barriers, closing to the road only, have long been standard practice where plain warning signs—with, in more recent years, flashing lights in some locations—have been thought insufficient. Over 30 years ago it was proposed to use barriers in Great Britain, but this necessitated a change in the law. Although a few came into service on industrial lines, where the ordinary regulations did not apply, not until 1952 were barriers—installed under the authority of a special Act of 1947—to be seen at a public crossing over a main line. Here, it is to be noted, they have functioned very satisfactorily ever since. The obligation to maintain an attendant remained, however, and even after barriers were legalised for general use. When relief from this obligation was obtained in 1957, under certain defined conditions, the way became opened to the adoption of remote and automatic control of barriers, already known for some time in other countries, with the possibility of a reduction in operating and other charges.

The paper on lifting barriers read on November 10 before the Institution of Railway Signal Engineers by Mr. E. G. Brentnall, Signal Engineer, London Midland Region, and a member of the working party sent in 1956 by the Minister of Transport & Civil Aviation to study practice on the Continent, was thus timely. It made available to members of the Institution, by special permission, details of the hitherto unpublished requirements laid down provisionally by the Minister for installations of this class. It was emphasised by Colonel D. McMullen, who had led the working party and who opened the discussion, that these requirements were not mandatory. Admittedly they leant to the side of caution but might be modified on sufficient grounds, especially after some experience had been obtained with remote and automatic controls. Safety was still necessarily the primary consideration but it was believed, after thorough study, that, provided certain conditions could be fulfilled and the public educated to understand and conform to new methods, delays to road traffic could be greatly reduced without lowering safety standards. Appreciable material benefits to the railways also should follow. It is known that many local authorities favour some change in methods of crossing protection, but also that many people are reluctant to see a departure from long-established practice. Undoubtedly it will be necessary to proceed with care.

A start has been made, for example, with " on call " barriers, and some automatic half-barrier installations have been designed under the new requirements. With these it is impossible for a vehicle to become imprisoned on a crossing, but it is imperative that the falling of the arms shall be followed invariably within a brief interval by the arrival of a train, so that the road user may learn to regard the closed barrier as a positive imminent danger warning and never try to zig-zag past it, though this would in any case be a violation of the Highway Code, the latest edition of which contains explicit directions on the point. Automatic operation admittedly brings problems of its own, some of which diminish as the speeds of the trains become more nearly uniform. Speed measuring apparatus has been used to a small extent abroad, but, as Colonel McMullen pointed out, it was thought highly desirable, to begin with, that control equipment should be kept as simple as possible. Therefore the provisional requirements had been based on that principle. Experience of course will show what other arrangements are desirable or permissible and often there will be local conditions affecting the problem. It is obvious that a high standard of maintenance is essential. Apparatus may be designed to fail always on the safe side, but it is of the utmost importance that it shall hardly ever fail at all. Otherwise there is a risk of road users losing respect for it and becoming tempted to ignore its warnings. The paper made it clear that the powers conferred by the Act of 1957 were already being used in a realistic spirit, and that before long appreciable benefits should accrue from turning to methods which have proved themselves elsewhere and are in harmony with the conditions of today.

British Transport Commission Traffic Receipts

THE rise in British Railways passenger fares on November 1 might have been expected to result in more revenue than the £8,935,000 passenger receipts for Period 12, the four weeks ended November 29. The excess over the corresponding figure for 1958 was £496,000. There is no valid comparison with receipts (£9,555,000) for the preceding four weeks, as traffic drops off in November. London Transport bus and motor-coach receipts were up on last year's figure. The rise in L.T.E. Underground receipts was mainly the result of the fares increase.

	Four weeks to Nov. 29, 1959		Incr. or decr.	Aggregate for 48 weeks		Incr. or decr.
	1959 £000	1958 £000	£000	1959 £000	1958 £000	£000
Passengers—						
British Railways ...	8,935	8,439	+ 496	129,343	127,938	+ 1,405
London Transport						
Road Passenger Services ...	4,284	4,184	+ 100	50,657	44,477	+ 6,180
Railways	1,982	1,860	+ 122	21,830	22,519	- 689
Provincial & Scottish Buses ...	4,206	4,147	+ 59	56,448	55,795	+ 653
Ships	189	190	- 1	7,211	6,616	+ 595
Total Passengers ...	19,596	18,820	+ 776	265,489	257,345	+ 8,144
Freight, Parcels & Mails						
British Railways						
Merchandise and livestock ...	8,673	8,404	+ 269	90,841	96,029	- 5,188
Minerals	3,902	3,625	+ 277	40,788	41,709	- 921
Coal & coke ...	8,794	9,420	- 626	99,847	112,498	- 12,651
Parcels, etc. by coaching train ...	4,440	4,196	+ 244	49,646	48,755	+ 891
Total freight, British Railways	25,809	25,645	+ 164	281,122	298,991	- 17,869
Others*	4,753	4,283	+ 470	51,529	49,858	+ 1,671
Total Freight, Parcels & Mails ...	30,562	29,928	+ 634	332,651	348,849	- 16,198
Total	50,158	48,748	+ 1,410	598,140	606,194	- 8,054

*Road haulage, ships, and inland waterways freight

Ships' passenger receipts were slightly below the 1958 total for the period, the first fall below the equivalent figure for the previous year that has occurred for some time.

There is a seasonal drop in traffic in November, but £189,000 for Period 12 is small compared with £315,000 for the four weeks to November 1, which represented an increase of 16 per cent. over Period 11 of 1958. The British Transport Commission statistics do not show the ships' passenger receipts by services.

The output of steel in Britain last month was a record. British Railways mineral receipts for the period November 2-29 were £3,902,000, compared with £3,625,000 a year ago and with £3,897,000 for the preceding four-week period. Merchandise receipts at £8,673,000 are encouraging, against £8,502,000 for Period 11, and £8,404,000 for Period 12 of last year. Road haulage, ships' cargo and inland waterways freight traffics were well up on the corresponding group total for these weeks of 1958. The greatest proportion of this increase would appear to be derived from British Road Services, and, like British Railways merchandise receipts, reflects increased industrial and commercial activity generally, besides efforts made to capture traffic.

The aggregate traffic receipts of the Commission for 48 weeks of 1959 at £598,000,000 were £8,000,000 below last year's aggregate for these weeks. The gap is being closed, for the difference was over £9,000,000 for the 44 weeks to November 1. The decline in coal class traffic receipts is shown in the 48-week aggregate of £99,847,000, against £112,498,000 last year, and this trend is expected to continue.

PERCENTAGE VARIATION 1959 COMPARED WITH 1958

	Four weeks to November 29	48 weeks to November 29
British Railways:		
Passengers	+ 5·8	+ 1·1
Parcels	+ 5·8	+ 1·8
Merchandise & livestock	+ 3·2	− 5·4
Minerals	+ 7·6	− 2·2
Coal & coke	− 6·6	− 11·2
Total	+ 1·9	− 3·8
Ships (passengers)	− 0·5	+ 8·9
British Road Services, Inland Waterways & Ships (cargo)	+ 10·9	+ 3·3
Road Passenger Transport, Provincial & Scottish	+ 1·4	+ 1·1
London Transport:		
Railways	+ 6·5	− 3·0
Road services	+ 2·3	+ 13·8
Total	+ 3·6	+ 8·1
Aggregate	+ 2·8	− 1·3

The Australian Rolling Stock Industry

ONE of the subjects covered by a review based on a recent survey by the Australian Department of Trade of the progress of engineering manufacturing industries in Australia is railway rolling stock. The range of items produced in the Commonwealth includes all kinds of passenger and goods stock, diesel-hydraulic, diesel-electric, and diesel-mechanical locomotives, and diesel railcars, though the engines, transmissions, electric generators and other components are imported. Some 15 firms are engaged in rolling-stock building. The value of contracts placed by the railways for stock has averaged during the past five years some £A.15,300,000, but it has just recently been inclined to fall because of increased manufacture in State Railways' workshops. In fact, most firms are reported to be working at only 50-70 per cent rolling stock capacity on a single-shift basis, and the remaining capacity is being used for other purposes.

Among the major current contracts let for diesel-electric locomotives are 20 for the South Australian Railways and 40 for the New South Wales Railways to A. E. Goodwin Limited of Sydney; five for the Queensland Railways to the English Electric Co. of Australia Pty. Ltd.; and two for the Western Australian Railways to Clyde Engineering Co. Pty. Ltd.

The future demand for rolling stock would seem to depend mainly upon the finances that can be allocated to conversion to diesel traction and on general development, expansion and re-equipment of the State Railways. Meanwhile, exports of rolling stock rose considerably in 1957-58 to £A.3,000,000 including £A.1,700,000 for vehicles supplied under the Colombo Plan. Moreover in July, 1958, a further shipment valued at about £A.1,000,000 was made under that plan.

Grading of Sawn British Hardwoods

To enable British hardwoods, which are 40 per cent of all used in the United Kingdom, to compete on better terms of quality and price with the imported article, the Department of Scientific & Industrial Research has decided to recommend a grading of all British hardwoods. This grading has been approved by a committee representing both producers and consumers and has been published as Forest Products Research Laboratory Leaflet No. 52. The grading is based on a " defect system " as being simpler than others. As it seems to be a valuable guide to those responsible for passing sawn hardwood, in its many applications on railways, we quote it in detail.

The grading applies to all freshly sawn home-grown hardwoods, and permissible errors in sawing sizes are laid down. The grading of all pieces of timber under 2 in. thick must be done on the worst face, and for pieces over 2 in. may be done on the best face provided that the opposite face is not on a lower grade. Rot and decay must not be allowed except in pockets of under 4 in. in dia.

Three grades are laid down for square-edged timber, and the permissible defects in the different grades are given below:—

PERMISSIBLE DEFECTS AND CHARACTERISTICS OF DIFFERENT GRADES

Defect and characteristic	Permissible size of defect or characteristic		
	Grade I	Grade II	Grade III
Splits	For pieces 8 in. wide and less. Not exceeding in in. length of piece in ft.	For pieces 8 in. wide and less. Not exceeding in in. 1½ times length of piece in ft.	As for Grade II
	For pieces over 8 in. wide. Not exceeding in in. twice length of piece in ft.	For pieces over 8 in. wide. Not exceeding in in. three times length of piece in ft.	
	Individual splits not to diverge from a line parallel to edge of piece by more than 1 in. per ft. in length	Divergence as in Grade I	
Sapwood	Sound sapwood not a defect, but in oak not to exceed 20 per cent of width of either face	As for Grade I, but in oak not to exceed 40 per cent of width of either face	Unrestricted but must be sound
Stain	Not permitted except for brown heart in ash and and beech	As for Grade I	Unspecified
Bow and/or spring	Not exceeding 1 in. in 8 ft.	Not exceeding 1 in. in 6 ft.	Unspecified
Slope of grain	Not exceeding 1 in 14	Not exceeding 1 in 8	Unspecified
Heart	Not permitted	Sound heart allowed on one face in pieces 2 in. and more in thickness	Sound heart allowed
Wane	Not permitted	Not permitted in pieces under 2 in. thick; in pieces 2 in. or more in thickness not to exceed ⅛ of thickness, ¼ of width or ¼ of length	As in Grade II for pieces 2 in. or more in thickness
Knots, bark pockets, resin pockets, pockets of rot, pin knots, borer holes (see " Schedule of Defects" below)	One defect in pieces up to 4 sq. ft. in surface area. Every additional 2 sq. ft. one additional defect	Two defects in pieces up to 4 sq. ft. in surface area. Every additional 2 sq. ft. two additional defects	As in Grade II

The " Schedule of Defects " stipulates that one knot or a pocket of bark, resin, or rot within the limits of size listed below shall count as the number of defects noted against each:—

One knot, etc., over	⅜ in. dia.	and under	1½ in.	=	1 defect
,, ,,	1½ in.	,, ,,	2½ in.	=	2 ,,
,, ,,	2½ in.	,, ,,	3½ in.	=	3 ,,
,, ,,	3½ in.	... ...	...	=	4 ,,

A group of pin knots or borer holes not exceeding 2 in. x 2 in. in area or 4 sq. in. in all shall count as one defect. The measurement of the size of knots is defined, and bark and resin pockets are described in the leaflet; they are measured like knots. " Wane " is the original surface of a tree remaining on a piece of converted timber. " Bow " is the curvature of a piece of timber such that the face becomes concave or convex along the grain, whereas " spring " is the curvature if the piece is laid on edge, thus forming a flat arch.

XUM

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of Correspondents)

Cross-Country Diesel Services

November 28

SIR,—Mr. D. V. Cheney, in his letter published in your November 27 issue, states quite rightly that the through trains between York and Bournemouth should be considered as through trains, and not on the basis that they pay only between certain points. In this instance, I understand both the North Eastern and London Midland Regions took this obviously sensible view and pressed strongly for retention of the through service.

One of the benefits to be expected from nationalisation is unity of management. This is an example of isolationism engendered by Regional autonomy and illustrates the need for some higher authority to give a directive binding on all concerned and to whom matters in dispute can be referred. Unless such machinery is provided, we may expect more cases where passengers are stranded at inter-Regional boundary points, some much less attractive than Banbury, merely because there is no one to compel the offending Region to take the train forward.

Yours faithfully,

C. R. CLINKER

9, Regent Place, Rugby

Branch Line Closing

December 6

SIR,—Mr. Stocks makes the suggestion in your December 4 issue, that local councils might help with assistance from the rates. Under Section 45 of the Railway & Canal Traffic Act, 1888, a derelict canal may be taken over by a local authority and the expenses (Section 54) may be charged on the rates. There would seem to be no similar provision for derelict railways. Probably those who framed the Act did not expect that railways would go the same way as the canals.

Early in 1952, a borough council was protesting at the proposed closing of its branch railway. The writer approached the town clerk, suggesting that his council, as a gesture of assistance, should forgo the rates. An indignant reply was received saying that railways should pay more, not less, rates. The sequel was that the borough lost both its train services and also the rates.

The suggestion to increase the fares on branch lines to cover costs seems to be the opposite of the old principle of basing fares on what the traffic would bear. The more profitable services will better bear an increase in fares. On the others, lower fares, by bringing more business, might result in increased revenue.

Yours faithfully,

R. G. R. CALVERT

45, Woodwaye, Oxhey, Watford

Centralised Traffic Control

December 1

SIR,—I refer to Mr. C. P. Lovemore's letter in your October 30 issue. He refers to NX, as it is known to practical signal engineers, as EN.EX systems. How pure can you get ?

To revert to C.T.C., as he has quoted Chapter I of the "History and Development of Railway Signalling," published by the Association of American Railroads, I feel that he should read page 54. I quote : "The C.T.C. System combines the safety features of modern Automatic Signalling and power interlocking. Each end of each siding is, in fact, a small interlocking plant remotely controlled." The same work (Chapter 14) defines C.T.C. as "The term applied to a system of railroad operation by means of which the movement of trains over routes and through blocks on a designated section of track or tracks is directed by Signals controlled from a designated point without requiring the use of train orders and without the superiority of trains."

The British Transport Commission knew exactly what it was doing when it called the re-signalling of the Central Wales Area C.T.C., as it was taking the modern and accepted term C.T.C. for what it is, and did not mean: "the remote control of signals and points by an operator from a position remote from the area under direct control," and so on.

After all, the Commission was discussing the "modernisation" plan, not the development of C.T.C. from the electrically-released hand-operated points, to the modern carried controlled system of today. On the original C.T.C. installed on the Rhodesia Railways from Heany Junction to Gwelo, the train crews operated the points. Now we control the points from the C.T.C. Panel. According to Mr. Lovemore, we no longer have C.T.C. !

Yours faithfully,

D. H. CONSTABLE
Assistant Signals & Communications Engineer

P.O. Box 604, Bulawayo, Southern Rhodesia

Writing on the Right Lines

December 8

SIR,—I refer to the letter from Mr. K. J. Lee in your November 27 issue. The English language is remarkable for the subtlety of its meaning and it is possible to say, "Please, tell me," with an infinite variety of expression ranging from commanding to entreating. It is often expedient in normal commercial correspondence to have to convey any of these impressions and it is an advantage to be able to use the words provided in the English language without stunting one's true meaning by using terse "standard" expressions that do not quite say what one means.

Mr. Lee's proposal would be universally acceptable if everyone were educated to see things his way. The hard fact of commercial life is that the man who writes a verbose letter full of business jargon expects something like it in return and is likely to be offended by a direct style of writing. I know this because I have had personal experience of customers who have complained about the "offensive tone" of some letters from my office, which, whilst polite, were written in a direct and concise manner. Two or three minutes of soothing (and verbose) blarney on the telephone has always put the matter right, but there is a lesson in this which is worth remembering.

There is another point, too. To be able to write clearly, briefly, and accurately one must have a good knowledge of English to start with. If a person does not possess this, an attempt to teach clear writing may result in the use of a degraded form of basic English which would sound both ugly and offensive and would waste the infinite possibilities of the most versatile language in the world.

Yours faithfully,

R. E. VINCENT

83, Marlands Road, Ilford

Dogs by Rail

December 5

SIR,—The first time I took my dog for a train journey in South Australia, I was indignant when he was taken from me and locked in the "dog box." This is one of a number of built-in kennels in the guard's van, ventilated by slats in the outer wall. When I visited him later, he was comfortable and cool and interested in watching the countryside through the ventilator. On arrival, he was rested and fresh after the long journey. The other passengers were not inconvenienced by his presence, and I was able to enjoy the trip.

I recommend this method for its comfort and safety and suggest its adoption by British Railways.

Yours faithfully,

ALICE PECK

17, Russell Avenue, St. Albans

[Dog boxes at one time were built into guards' compartments on several British railways. Variation in the size of dogs makes it hard to design a box both snug and not cramped, and the vagaries of our climate complicate the problem of ventilation. Dogs can travel comfortably tied up in the van, in charge of the guard.—ED., *R.G.*]

THE SCRAP HEAP

Good Turn

An acting ticket collector, Mr. N. Uttley . . . was seen being more than usually helpful and pleasant to passengers arriving at Darlington Station. One, a lady, had lost her purse, including her ticket and all her money. She hadn't even the price of her bus fare home to Newton Aycliffe. Her plight might have been a matter of no concern to some folk but in the best traditions of our "Friendly Region" Mr. Uttley put his hand into his own pocket and presented her with half-a-crown. She returned later to pay her fare and return the loan.—*From "British Railways Magazine," North Eastern Region Edition.*

Rejuvenating a Relic

A 15-in. gauge steam locomotive, *Pearl*, about 6 ft. long, 2 ft. wide and 3 ft. 6 in. high, which for many years has stood on a main staircase at Kings College, London, has been dismantled by the College railway club and removed to the workshops for an overhaul. If the boiler stands up to tests, the club would like to try the locomotive out on the 15-in. gauge Romney, Hythe & Dymchurch Light Railway. The club would also like to use the locomotive in some way to raise funds for the Lion Club, Hoxton, which the college helps to run and for which it is trying to raise £10,000. The locomotive is believed to have been built by an engineering student about 1860.

W.C.J.S. Mail Van Preserved

A notable addition to the historic rolling stock preserved at the depot at Clapham is West Coast Joint Stock mail van No. 186, recently transferred from Wolverton Carriage Works, London Midland Region. The illustration shows it *en route* to Clapham, coupled to the Duke of Sutherland's saloon, also preserved, and illustrated in our November 6 issue. A feature of the mail van is its four separate axles. It has been repainted in W.C.J.S. (almost the same as London & North Western Railway) livery. The fitting of Webb radial trucks was a characteristic of L.N.W.R. and W.C.J.S. vehicles at the end of the last century.

Courtesy

Where will you find a more courteous team of ticket collectors than that at Waterloo Station? Their politeness is remarkable even extending to "Thank you, sir," on production of a season ticket. "Good morning, madam," is a commonplace. Scores of times I have heard different collectors inquire after passengers' health and in the evening when they are not so busy they will crack a joke.—*From a letter to "The Evening News."*

They Breed 'em Tough in Halifax

Mrs. Harry Humphries, who headed out of New York in June, 1911, at the age of 25, with the object of walking 48,000 miles around the world, was a girl from Halifax, England. Her brother, Mr. A. T. Yates, now a retired engineer living near Oldham, mildly recalls that, "Lizzie was always something of a wanderer, never much good at housework."

After working for a time with the Canadian Pacific Railway, Lizzie went on the New York stage where she met and married her husband. The Humphries took "a short honeymoon walk" of 2,500 miles to Florida and back. It took them two months at the rate of 41 miles a day. On the way, Mrs. Humphries was caught on a trestle railway bridge with the Florida Express thundering down at her. She climbed into a fire-tub hanging from a sleeper high above the ravine, and waved to the engine-driver. He was so astonished that he kept the train waiting at Jacksonville to find out if she had survived.

She had. After many adventures, including the discouragement of unwelcome male attention with the business-end of an 11-chamber revolver, an escape from wolves in Newfoundland, and meetings with King Haakon and the Tsar of Russia, she survives today, at the age of 73, at Miami, Florida. Six years ago, she began taking a course in commercial art.—*From "The Guardian."*

Advertising by the Train-load

The practice of reserving all advertising space in a train is growing. From January 1, all roof card space in another London Underground train with light-alloy coach bodies, on the District Line, has been let to one individual advertiser, the London & Manchester Assurance Co. Ltd. This is the second full display to be taken by the company which has been greatly impressed by the success of its similar campaign in one of the "silver" trains on the L.T.E. Piccadilly Line. Five different designs, by David Pratt, F.Z.S., featuring animals which rely for their safety on natural camouflage or protective armour, are being used to fill the 264 roof card spaces. The message reads "Let London & Manchester be your protection." The London & Manchester Assurance Company is using the same designs in the other light alloy train, also for displays throughout the Underground and in British Railways passenger vehicles. The order was placed by Central Advertising Service Limited with British Transport Advertising, the commercial advertising service of the British Transport Commission.

New Year's Eve

Once more the time has come to wind the clock,
To count our transient blessings and take stock.
How stands the cause of railway operation
After, for instance, branch-line amputation?
Is it too early yet to form conclusions
About reactions to the blood transfusions
Of State assistance, liberally applied,
In spite of criticism, Argus-eyed?

Maybe the coming year will make more clear
Where progress lies and where we go from here,
But those engaged in railway transportation
Find little scope for arid speculation.
Far better be content, upon reflection,
To keep things moving in the right direction,
With, now and then, a fervent invocation
To be preserved from such forms of stagnation
As test elsewhere the ingenuity
Of our enthusiastic M. of T.

Hopefully, then, we tighten girths and borrow
From faith's rich store new courage for the morrow,
Filled with determination, come what may,
To set the New Year blithely on its way.

A.B.

Photo] [*A. Earle Edwards*

Eight-wheel West Coast Joint Stock mail van with four separate axles, now preserved by the British Transport Commission at the depot at Clapham

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Radio Control Cartage Service

Rhodesia Railways has introduced radio control for certain cartage vehicles in the Bulawayo area. A similar system has been used in Salisbury for some time. This development follows the success of the "Railstar" service for express goods on the Bulawayo-Salisbury line. The Bulawayo railway cartage service is supplementary to that already operated by the local cartage contractors who have also installed radio in vans.

Benefits to customers and the railways have quickly become apparent, and it is appropriate that the flexibility of the cartage service should be increased, now the "Railstar North" train has commenced. This train provides a daily express goods service at mail speed right through Northern Rhodesia as far as Ndola with connections to the Copperbelt towns. The capacity of the radio equipment can be extended as needed.

Carriage of Cattle

As Northern Rhodesia, particularly the Copperbelt area, has developed, so has the long distance rail traffic of cattle. Special arrangements are needed for resting, feeding, and watering. Until recently, beasts loaded in Southern Rhodesia have been fed and rested at Livingstone and Monze, but this has not been regarded as satisfactory for some time past. The second resting place has now been changed to Nsofu, about a mile south of Broken Hill, where new facilities costing £17,500 have been provided.

Cattle traffic requires special care if beasts are to travel in reasonable comfort and arrive in good condition for slaughter. Transit times must be kept to a minimum as must the number of loadings and unloadings of each batch of animals, and the facilities at Nsofu, which include resting pens, a hay barn, loading bank, a truck washing slab, and a checker's office are a big improvement as regards the time factor.

Animals destined for the Copperbelt and the Congo will now rarely spend more than 36 hr. at a stretch in trucks. Under the old arrangements, up to 40 hr. was not uncommon. Cattle are rested at staging points for 24 hr. These new facilities will be of considerable benefit to the handling of livestock traffic by rail in Northern Rhodesia.

EAST AFRICA

Oil Refinery at Mombasa

At a short informal meeting on December 8, Mr. E. E. Hudson, the General Manager of the Shell Co. of East Africa Ltd. and B.P. (East Africa) Limited, and Mr. J. R. Farquharson, the Acting Commissioner for Transport, East Africa High Commission, signed an agreement whereby the Shell and B.P. groups acquire land at Changamwe for the erection of an oil refinery. The East African Railways & Harbours has agreed on its part to grant way leaves for pipelines to the refinery and to construct a tanker berth in Port Reitz. The agreement also covers the work involved in dredging, both in the area of the tanker berth and at the entrance to the harbour that may be necessary to permit tankers of up to 70,000 deadweight tons to be operated by the petroleum company.

In an *aide-mémoire* to the agreement it was further agreed that the E.A.R. & H. should give the refining company an option to purchase some 236 acres of the E.A.R. & H. industrial estate at Changamwe. Approximately 10 acres of land are to be reclaimed from the sea, near the new tanker berth, and this also will be made available to the petroleum company for the purpose of erecting pumping, pipeline, tankage, and such other facilities as may be required.

Steam Haulage in East Africa

A "59" Class Beyer-Garratt locomotive heading a goods train across the Makupa Causeway, linking the mainland with Mombasa Island, East African Railways & Harbours

WESTERN AUSTRALIA

New Fremantle Railway Bridge

The proposed new railway bridge to be constructed immediately downstream from the road bridge crossing the River Swan at North Fremantle will provide for two railway tracks of 3 ft. 6 in. gauge with an allowance for conversion to 4 ft. $8\frac{1}{2}$ in. gauge in the event of the conversion of railway gauges in the State. The new bridge is expected to give 29 ft. head room above low water mark at the main navigational spans, which is the same as provided under the existing road bridge.

Ten bores have been put down along the general line of the proposed bridge and further boring is to be undertaken to furnish the consulting engineers with a picture of the river bed structure to enable the bridge design to proceed. Testing of soil samples and of bore cores is in progress by Railway Department engineers working at the University Testing Laboratory. It is expected that boring will be completed within two months.

Arrangements are in hand for the design of the bridge to be carried out by Messrs. G. Maunsell & Partners, Consulting Engineers of London, who executed the design for the Narrows Bridge, and who will arrange for the calling of tenders and subsequent supervision of the work. Use has been made of aerial survey in the initial location work, and will be followed up by field work in levelling for earth work quantities. Consideration will be given to the problem of road traffic flow, and of wharf access, as the Consulting Engineers develop the layout and design most suited to the site.

GREECE

Settlement of Rail Construction Dispute

The long drawn-out dispute between the Belgian railway construction concern Socobelge and the Hellenic Government arising from a concession granted to the company for the construction of a standard - gauge railway in northern Greece was recently settled by an agreement whereby the Government is to pay to the company $670,000 in two annual

instalments without interest, as well as the drachmae equivalent of $3,300,000. This drachmae amount has to be re-invested by the company in Greece, and may be transferred abroad in 10 years beginning five years after the completion of the investments. The yield, up to 7 per cent may be freely transferred abroad.

ARGENTINA

Supply of Brazilian Material

As a result of a visit paid to Brazil by the Minister of Public Works & Transport, Eng. Alberto R. Costantini, an agreement is being drawn up by which Argentina will receive railway material in part payment of the Brazilian debt, which amounts to almost $30,000,000. The principal items to be supplied would be rails, bogies, tyres and brake cylinders, which would enable 10,000 wagons at present out of service to be returned to traffic almost at once.

BRAZIL

Brazil-Bolivia Railway

The 1,000-m. bridge over the Rio Grande, completed in 1956, has had to be lengthened by 400 m., the course of the river having been diverted by floods. The completion of the extension coincided with the grant by the Bolivian government to Brazilian private companies to exploit petroleum in the Santa Cruz de la Sierra region. Pending construction of the projected oil duct to Santos the oil will be conveyed by rail to Corumba, the Brazilian terminus in Mato Grosso.

UNITED STATES

New York Central $70 Million Plan

The New York Central System is seeking a $40,000,000 guarantee from the Federal Government to help in financing a development programme estimated to cost $70,000,000. The money is to be spent in equipping three new electronic marshalling yards, one at Indianapolis, and nine new centralised traffic control projects. These last are for the resignalling of various sections of the New York-Chicago main line between New York and Toledo, Ohio; and between Cleveland and Terre Haute, Indiana, on the "Big Four" main line to St. Louis.

The loans would be obtained from various insurance companies, and the terms would call for 5 per cent interest per annum, and repayment in 12 equal annual instalments, beginning in 1963. The New York Central is the fourth railway to seek such a loan guarantee, the others being the Boston & Maine (whose application has been approved), the New York, New Haven & Harford, and a smaller company.

FRANCE

New Marshalling Yard

As part of its policy to modernise and concentrate marshalling yard facilities, and in conjunction with the electrification of the Lyons-Marseilles line as far as Avignon, the S.N.C.F. decided to construct a new marshalling yard to the south of Avignon. This new yard, now complete, stretches over a distance of some two miles. It includes seven 656-yd. reception sidings and 24 sorting sidings, each 656 yd. long, with two gravity shunting humps and an automatic ball control system for the points leading into the sorting sidings. In addition, various other works are taking place in the vicinity, the most important being the construction of a new PRS-type signal-box which will control all points and signals over a wide area, and two new tracks to enable régime ordinaire goods trains to by-pass the passenger station.

Reinforcement of Montaud Viaduct

The 1,380 ft. double track Montaud Viaduct adjacent to Saint Etienne-Châteaucreux Station, originally built in 1859, has for many years been subject to a 30 km. speed limit because of its liability to subsidence. This viaduct comprises 48 spans, of which five were steel, the balance being of masonry. Mining, recommenced in 1943, brought about further subsidence which was dealt with by the injection of cement. Since 1956, subsidence has largely ceased and the S.N.C.F. decided to take steps towards the stabilisation of this structure. Recently, therefore, two particularly affected concrete arches were replaced by metal deck spans resting on concrete blocks, these latter being raised above the adjacent piers to prevent the load bearing on the suspect arches. During this engineering work, single-line working continued.

AUSTRIA

Higher Rates and Fares

The Austrian Federal Railways, suffering from substantial working deficits over a number of years, intends to increase its passenger fares from January 1, 1960; as to goods rates there seems some doubt whether the reform which it is planned to introduce together with the increase will be completed in time for the beginning of 1960. It is believed, therefore, that the increase in goods rates will be effected by March 1, 1960, at the earliest.

The increase in passenger fares will average 25 per cent but will be lower for the first class. As a result, first class fares will be equivalent to 1·7 of the second class fares. At present first class fares are double the second class fares. Luggage rates are to be increased by 25 per cent.

As to goods rates the number of tariff classes is to be reduced from seven to five. The basic rates for the new classes (A to E) will be tied to the unit rate of class A which latter will be 25 per cent higher than the present basic rate of class A. Exceptional rates, numbering some 130 varieties, are to be increased by 20 per cent. On the other hand, transit rates, increased by 20 per cent in 1957, will remain unaltered the principle having been adopted that transit rates must be lower than inland rates. The last increase in passenger fares and inland goods rates was introduced in May, 1952.

Publications Received

Het Ijzeren Paard : Versierd Verslag vae de Lotgevallen van de Stoomlocomotinf (The Iron Horse; the Story of the Steam Locomotive illustrated). By Marie Anne Asselberghs. Amsterdam : De Bezige Bij. 10¼ in. by 7½ in. 226 pp. Illustrated. No price stated.—This well produced and illustrated publication has been issued to mark the close of the steam era on the railways of Holland. The great variety of material, mainly historical, covers the development of the steam locomotive in that country and to some extent elsewhere. There are many reproductions of old engravings, and photographs of opening notices, timetables, service instructions, tickets, stations, and so on, with illustrations of locomotives from early times to the journey of the last steam train to the Railway Museum at Utrecht in January, 1958. Most aspects of railway are touched on, in some cases briefly.

Wheel Profile Truing Machines.—The Atlas "Standard" Wheel Profile Truing Machine for wheel reconditioning at rail level, as used by British Railways and other systems, is fully described in a publication issued by the Atlas Engineering Company, 48 Princes Gate, London, S.W.7, which manufactures under licence from the Standard Railway Equipment & Manufacturing Company, Chicago. The machine is made for any gauge from metre to 5 ft. 6 in. and wheels of 28—54 in. dia. Illustrations show how a locomotive may be driven over the profiler for machining without the need for dismantling of traction gear, sanding equipment, or brake gear. One man can position and recondition a four-wheel unit in 2—4 hr. ready for it to continue in service. A six-wheel unit takes 4—5 hr. Information is provided under the following headings: Maintenance; Positioning and removal of vehicle; Swarf disposal unit; Production times; Machine constructional details; Electrical equipment; Hydraulic equipment; Cutting speeds; Hydraulic hold-down equipment; Installation of machine in pit; Leading particulars; Standard equipment supplied; Optional extra equipment. There is a list of 22 railways in the United States and throughout the world which use the Atlas "Standard" machine.

XUM

The Riding Properties of Bogie Vehicles—3*

Theoretical prediction of railcar and locomotive riding performance as an aid to the rationalisation of bogie design

By J. L. Koffman

A good example of unsymmetrical bogie vehicles is the motor car of the diesel-hydraulic TEE train of the German Federal Railways

RECENT vehicle development has led to the introduction of railcars and locomotives with unsymmetrical body-weight distribution resulting in the use of bogies of differing design at each end. Representative designs of this type are the power cars of the German TEE trains and the power cars of British Railways de luxe trains, the power cars of B.R. Southern Region diesel-electric trains, the London Midland Region 1,200 h.p. Type "2" Class D5700 Co-Bo diesel-electric locomotives and the electric Co-Bo 50-cycle locomotives of the Hungarian State Railways.

With symmetrical vehicles having an even weight distribution and using bogies of identical design incorporating springs of equal stiffness at each end, bouncing oscillations will not excite pitching and vice-versa. Here the body has two degrees of freedom in the vertical plane, one in translation about the lateral (Y) axis through the centre of gravity, and the other in rotation, but since generally there is no coupling action between these modes, they will not affect each other. With a (ft.) and b (ft.) being the distance from the front and rear bogie centre to the centre of gravity of the body and r (ft.) as the radius of gyration, a special case will be represented by the relationship $ab=r^2$. In this case the springs will not affect each other since each is a centre of oscillation for the other. Similar considerations apply to the lateral oscillations of the body on the swing links or due to the lateral elasticity of helical bolster springs (8, 13).

Determination of Natural Frequencies

When it comes to oscillation of unsymmetrical systems due consideration must be given to the presence of a coupling effect between inertia and spring forces. As shown in Fig. 13 the natural frequency ω_b (radians per sec.) of purely bouncing oscillations can be readily determined as long as the spring stiffness c_t and the body mass are known and provided the body is ideally, without friction, restrained to move only up and down. Similarly, if the body is restrained to rotate about the lateral (Y) axis through the centre of gravity, it is possible to determine the natural frequency of pitching ω_p as also shown in Fig. 14. However, as far as bouncing is concerned, the vehicle body will tend to pursue a purely translatory motion only as long as the resultant P_t of the spring forces P_a and P_b will pass through the centre of gravity, i.e. as long as $a=b$ and $P_a=P_b$ or $c_a \times a=c_b \times b$, i.e. $c_a/c_b=b/a$, where c (lb./ft.) is the spring stiffness due to the springs at one end of the vehicle. If this is not the case then the spring coupling moment M_{cv} due to the action of the resultant spring force P_t on the centre of gravity of the body via the arm k_{cv} will tend to rotate the body, thus exciting pitching oscillations at the centre of gravity. Reference is made to a "positive coupling" if P_t is applied ahead of the centre of gravity, while the coupling becomes negative if $c_a a < c_b$ (14).

If the body is restrained to oscillate only about the lateral (Y) axis through the centre of gravity, Fig. 14, then the axis bearings will be required to deal with the instantaneous forces due to the spring deflection. Here the forces due to the two sets of springs will oppose each other since one is compressed and the other expanded, the resultant force P_c being the difference of the absolute values of these spring forces. The value of P_c is given in Fig. 4 and it becomes zero for $c_a/c_b=b/a$, i.e. the spring coupling force will disappear under the same circumstance as would the spring coupling moment M_{cv} of the bouncing oscillations. Unlike K_{cv} the spring coupling factor K_{cp} applicable to pitching does not permit a simple geometrical interpretation. It is a magnitude which multiplied with a moment will provide a force. If now the body is free to move without being restrained at the centre of gravity, then the coupling force P_c will result in bouncing oscillations of the centre of gravity being excited as the result of pitching. Similar considerations apply to the coupling action of dampers.

Simultaneous Oscillations

The above considerations indicate that the vehicle body will bounce and pitch simultaneously, the motion being composed of oscillations about an axis located between the bogie centres and one outside these. The oscillations at a lower natural frequency will resemble bouncing, while those at a higher frequency will be more akin to pitching. The lower (ω_I) and higher (ω_{II}) frequencies of these oscillations are derived (15) from the following equation:—

$$\omega_{I,\,II}=\sqrt{\left(\frac{\omega_b^2+\omega_p^2}{2}\right)\pm\sqrt{\left(\frac{\omega_b^2-\omega_p^2}{2}\right)^2+\frac{(c_a a-c_b b)^2}{mI}}}\ \text{[rad./sec.]}$$

where m [lb. sec.^{2}/ft.] is the mass and I [lb. ft. sec.^{2}] the moment of inertia of the vehicle body.

It might be mentioned here that for vehicle bodies generally the moment of inertia about the vertical (Z) and lateral (Y) axis through the centre of gravity are approximately equal, being given by:—

$$I_z=I_y=mr^2\ \text{[lb. ft. sec.}^2\text{]}$$

If the body centre of gravity is located at some distance e [ft.] from the centre of the vehicle, then in accordance with the parallel-axis theorem the moment of inertia of the body with respect to this axis will be:—

$$I_{z1}=I_{y1}=mr^2+me^2=m(r^2+e^2)\ \text{[lb. ft. sec.}^2\text{]}$$

If the bogies have primary suspension only, then the sprung mass of the bogies is virtually attached to the body as far as vertical oscillations are concerned, so that the total moment of inertia about the Y-axis will be:—

$$I_y=m(r^2+e^2)+I_{fb}+m_{fb}a_1^2+I_{rb}+m_{rb}b_1^2$$

where I_{fb} is the moment of inertia of the front bogie about its centre of gravity and a_1 the distance from the centre of gravity of the bogie to that of the vehicle, the index f and r referring to the front and rear bogie, respectively.

The moment of inertia of the sprung portion of the bogies about the relevant

* Parts 1 and 2 appeared in our issues of November 27 and December 11 respectively

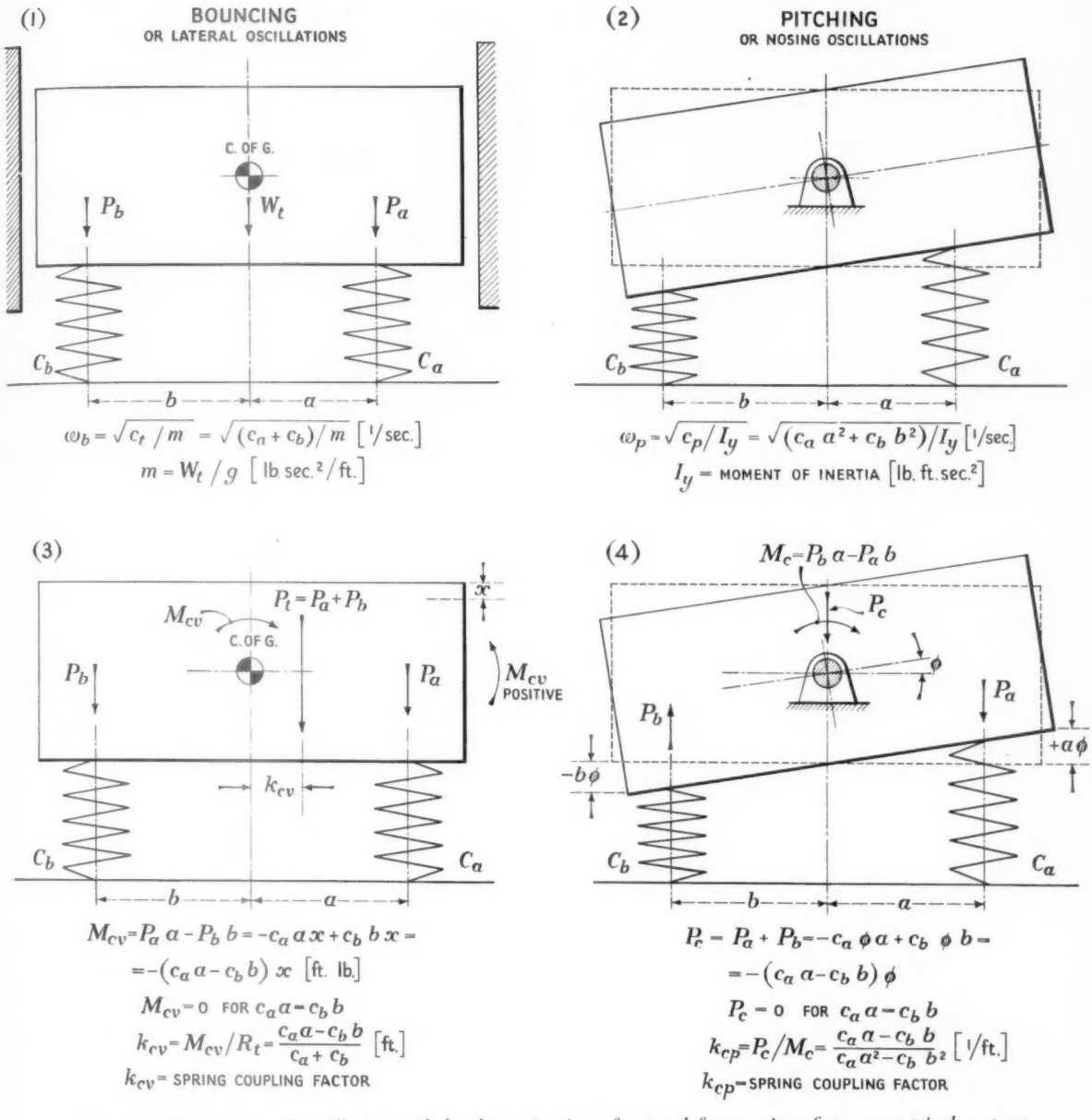

Fig. 14—The pattern of oscillation and the determination of natural frequencies of unsymmetrical systems

centre of gravity less the sprung mass of the axle-hung motors is approximately given by:—

$I_{yb} = m_b l^2/12$ [ft. lb. sec.²]

where l [ft.] is the frame length.

The centres of rotation of the two modes of oscillations can be determined as shown in Fig. 15 (16). Here it is of interest that the product of the translation co-ordinate (m) and the rotation co-ordinate (n) is equal to the square of the radius of gyration.

Application of Formulae

The application of the above considerations may be illustrated for the case of a heavy power car of a 2,200-b.h.p. seven-car 226-ton diesel-hydraulic German Federal Railways Trans-Europ Express train (17), illustrated on page 598.

The approximate plan layout of this is shown in Fig. 16. The 63 ft. long vehicle body weighs 36·5 tons of which 24 tons are carried by the driving (front) bogie. With a distance of 41 ft. 6 in. between bogie centres the centre of gravity will be 14 ft. 3 in. to the rear of the power bogie. The 1,100-h.p. engine weighs about 3 tons. It is about 5 ft. wide and some 6 ft. 3 in. long, and its centre is about 20 ft. ahead of the centre of gravity of the vehicle. Consequently, its moment of inertia relative to the centre of gravity of the vehicle body is:—

$I_{zc} = m(b^2 + h^2)/12 + mr_c^2$
$= (3 \times 2{,}240/32{\cdot}2)(6{\cdot}3^2 + 5^2)/12 + 208 \times 20^2$
$= 84{,}500$ [ft. lb. sec.²]

The hydraulic transmission weighs about 3·3 tons and its centre is about 12·6 ft. ahead of the centre of gravity of the vehicle body. It is about 3·8 ft. wide and 5 ft. long. Proceeding as above

$I_{zt} = 37{,}000$ [ft. lb. sec.²]

The vehicle body (less engine and transmission) carries auxiliary power plant, fuel tanks, the engine cooling equipment, brake equipment, batteries, heating equipment, and so on. Because of this its moment of inertia will be considered as being equivalent to that of a diesel locomotive of similar layout, i.e.:—

$I_{zb} = mr^2 = m(0{\cdot}22L)^2$
$= (36{\cdot}5 - 6{\cdot}3) \times (2{,}240/32{\cdot}2) \times (0{\cdot}22 \times 63)^2$
$= 405{,}000$ [ft. lb. sec.²]

This value will be further increased due to the fact that the centre of gravity

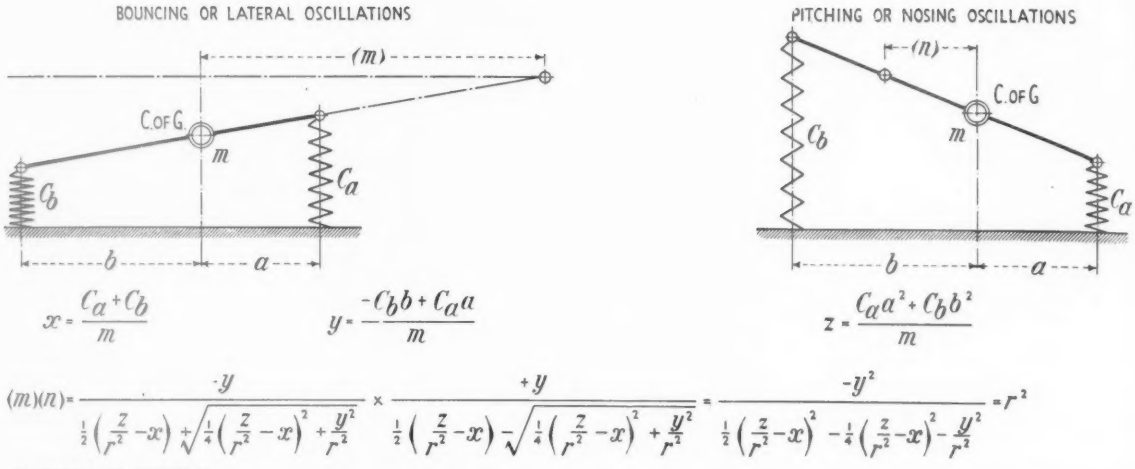
BOUNCING OR LATERAL OSCILLATIONS
(m)
C.OF G.
m
C_b
C_a
b
a
PITCHING OR NOSING OSCILLATIONS
(n)
C.OF G.
m
C_b
C_a
b
a
$x = \frac{C_a + C_b}{m}$
$y = \frac{-C_b b + C_a a}{m}$
$z = \frac{C_a a^2 + C_b b^2}{m}$
$(m)(n) = \frac{-y}{\frac{1}{2}\left(\frac{z}{r^2} - x\right) + \sqrt{\frac{1}{4}\left(\frac{z}{r^2} - x\right)^2 + \frac{y^2}{r^2}}} \times \frac{+y}{\frac{1}{2}\left(\frac{z}{r^2} - x\right) - \sqrt{\frac{1}{4}\left(\frac{z}{r^2} - x\right)^2 + \frac{y^2}{r^2}}} = \frac{-y^2}{\frac{1}{2}\left(\frac{z}{r^2} - x\right)^2 - \frac{1}{4}\left(\frac{z}{r^2} - x\right)^2 - \frac{y^2}{r^2}} = r^2$
r = RADIUS OF GYRATION
FOR $C_b \times b = C_a \times a$: $y = 0$ AND $(n) = 0$ AND $(m) = \infty$ i.e. UNCOUPLED PITCHING AND BOUNCING OR UNCOUPLED NOSING AND LATERAL OSCILLATIONS

Fig. 15—The determination of the centres of rotation of unsymmetrical systems

of the body assembly (less engine and transmission) is some 41·5/2 − 14·25 = 6·5 ft. away from the centre of gravity of the complete body, the resultant value being:—

$I_{zb} = me^2 = 2{,}100 \times 6{\cdot}5^2 = 89{,}000$ [ft. lb. sec.²]

The total moment of inertia of the vehicle body is the sum of the above values:—

$I_{zt} = 605{,}500$ [ft. lb. sec.²]

Lateral Stiffness

The bogies are provided with vertical swing links, the length being 13¾ in. and 17¾ in. for the power and trailing bogie, respectively. Consequently the lateral stiffness of the bolster suspension is:—

$c_l = 24 \times 2{,}240 \times 12/13{\cdot}75 = 47{,}000$ [lb. per ft.]

for the power bogie, while for the trailing bogie $c_l = 19{,}000$ [lb. per ft.]. The mass of the complete vehicle body is:—

$m = 36{\cdot}5 \times 2{,}240/32{\cdot}2 = 2{,}540$ [lb. sec.²/ft.]

so that in accordance with the equation of Fig. 1:—

$\omega_b = \sqrt{(47{,}000 + 19{,}000)/2{,}540} = \sqrt{26} = 5{\cdot}1$ [radians/sec.]

whilst $f_b = \omega/2\pi = 0.81$ (cycles/sec.)

Similarly, in accordance with Fig. 2.

$$\omega_p = \sqrt{\frac{47{,}000 \times 14{\cdot}25^2 + 19{,}000 \times 27{\cdot}25^2}{605{,}500}}$$

$$= \sqrt{15{\cdot}8 + 23{\cdot}5} = \sqrt{39{\cdot}3} = 6{\cdot}27 \text{ [radians/sec.]}$$

and $f_p = 1$ [cycle/sec.]

Thus the frequency of purely lateral oscillations is about 0·8 cycles per sec. as compared with 1 cycle/sec. for the oscillations of the body rotating about the vertical (Z) axis through the centre of gravity. The frequency of the coupled oscillations ω_I and ω_{II} can now be determined from:—

$$\omega_{I,II} = \sqrt{\left(\frac{26 + 39{\cdot}4}{2}\right) \pm \sqrt{\left(\frac{26 - 39{\cdot}4}{2}\right)^2 + \frac{(47{,}000 \times 14{\cdot}25 - 19{,}000 \times 27{\cdot}25)^2}{2{,}540 \times 605{,}500}}}$$

$\omega_I = 5$ [radians/sec.], $\omega_{II} = 6{\cdot}37$

The two coupled frequencies are:—

$f_I = 0{\cdot}8$ [cycles/sec.] and $f_{II} = 1{\cdot}01$

The vehicle speeds at which these frequencies will be in resonance with the sinusoidal oscillations of the wheels down the track can be obtained from the curves of Fig. 5, Ref. (8). Here for 3 ft. diameter wheels the frequency of 0·8 cycles per sec. corresponds to a road speed of about 35 m.p.h. as compared with 40 m.p.h. for 1 cycle per sec.

The position of the centres of oscillation can be determined along the lines indicated in Fig. 15. Here:—

$x = \omega_b^2 = 26$, $y = (47{,}000 \times 14{\cdot}25 - 19{,}000 \times 27{\cdot}25)/2{,}540 = 57{\cdot}8$

$z = (47{,}000 \times 14{\cdot}25^2 + 19{,}000 \times 27{\cdot}25^2)/2{,}540 = 9{,}330$.

The radius of gyration of the vehicle body with respect to centre of gravity is: $r^2 = 605{,}000/2{,}540 = 238$ ft.² and $r = 15{\cdot}4$ ft., so that the ratio $r/L = 0{\cdot}244$. Consequently $z/r^2 = 39{\cdot}2$, whilst $y^2/r^2 = 14$. With these values:—

$$(m)\,(n) = \frac{-57{\cdot}8}{\frac{1}{2}(39{\cdot}2 - 26) + \sqrt{\frac{1}{4}\,13{\cdot}2^2 + 14}} \times \frac{57{\cdot}8}{6{\cdot}6 - 7{\cdot}55} = -4{\cdot}1 \times -57{\cdot}8 = r^2 = 237 \text{ [ft.}^2\text{]}$$

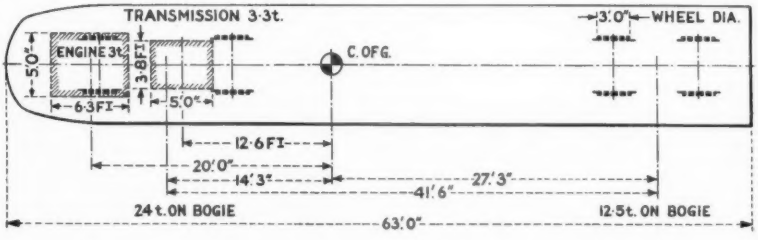

Fig. 16—Weights and dimensions of a 1,100-h.p. power car

The centre of nosing oscillations will be about 4 ft. to the rear of the centre of gravity and about 1 ft. ahead of the physical centre of the vehicle body. The semi-lateral oscillations will take place about a point some 58 ft. to the rear of the centre of gravity or some 31 ft. behind the rear bogie centre. The pattern of such coupled oscillations can be made clear with the aid of a simple model (18).

It is further of interest to determine the ride index values likely to be obtained in the lateral plane. The relevant calculations were carried out for a wheel flange-to-rail clearance of ¼ in. to each side, the frequency of excitation being in accordance with the data of Fig. 5, Ref. (8). Due account must be taken of the fact that body nosing consists of simultaneous displacement along the lateral (Y) axis and rotation about the vertical (Z) axis. With due regard for the resultant pattern of wheel motion and body oscillation and with particular reference to the relative transmissibility as affecting the magnitude of body displacement and with it the resultant lateral acceleration, it is possible to determine the ride index as a function of excitation frequency, i.e. vehicle speed (8). The resultant data is plotted in Fig. 17 for a lateral damping factor of D=0·3 and 0·4 which should be generally aimed to achieve satisfactory results (1).

It will be noted that at speeds in excess

of about 60 m.p.h. the ride index is of the order of 2·7 to 2·75 which in itself is satisfactory though not quite as good as should be aimed at with up-to-date vehicles. These values were obtained on the basis of a somewhat indifferent track inducing a free lateral displacement of $\pm\frac{1}{4}$ in. between wheel flanges and rails. With good track the relevant lateral accelerations can be reduced by as much as half of the previously obtained values, and the ride index values would be reduced to about 2·2 to 2·3. It might be of interest to mention that with the latest TEE trains the measured ride index value (17) is of the order of 2·2.

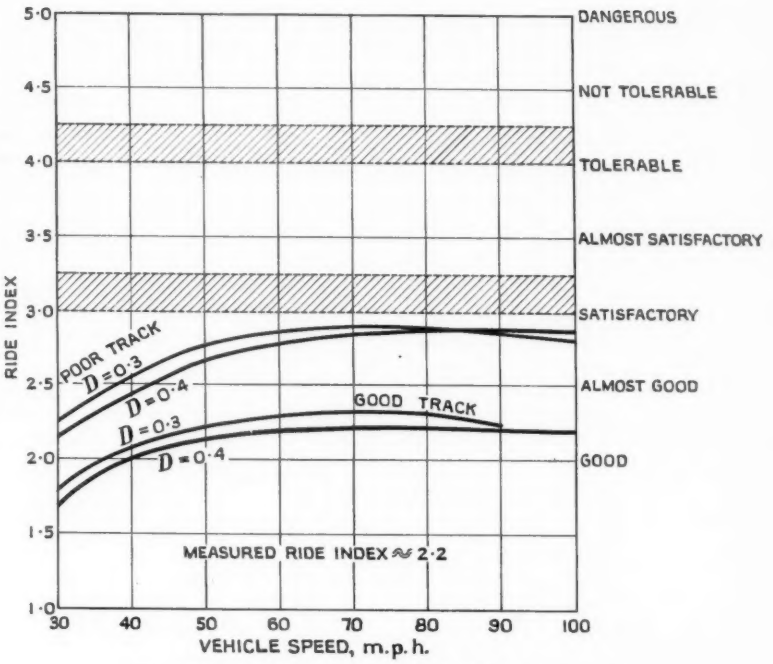

Fig. 17—Ride Index data of the 1,100-h.p. power car

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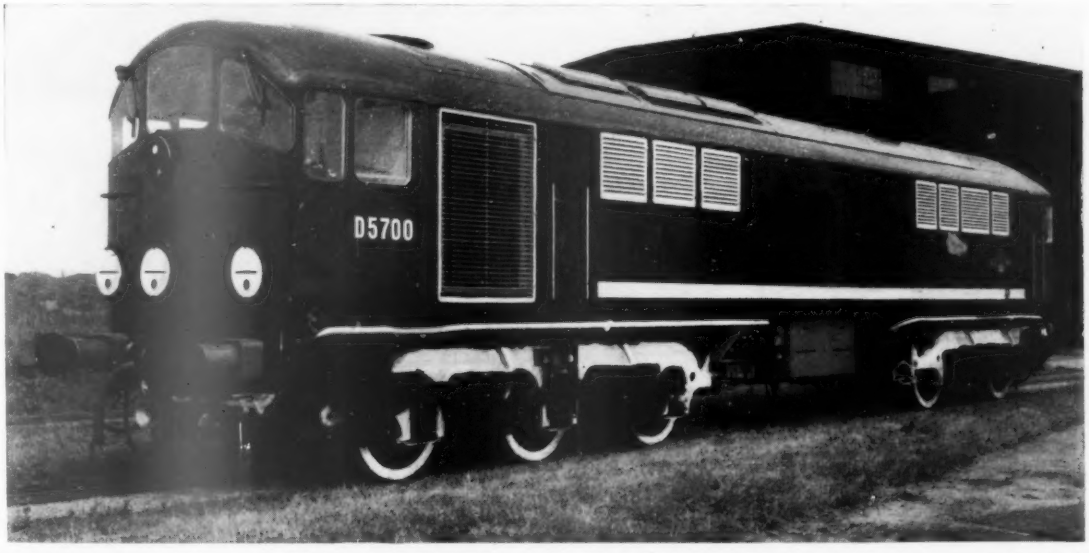


An unsymmetrical bogie vehicle on British Railways, the Type "2" Co-Bo diesel-electric locomotive built by Metropolitan-Vickers-Beyer Peacock Limited

D

Remote Control and C.T.C. on South African Railways

Progress of installation over sections totalling 234 miles

GOOD progress is being made with the installation of Centralised Traffic Control and Remote Control on the South African Railways. C.T.C. is being installed, at a cost of some £2,500,000, over sections totalling 234 miles with 50 stations affected. Similar equipment for a further 410 miles with 85 stations has been authorised at a cost of almost £6,000,000. The programme for the installation of remote control of interloops and stations, which was first introduced in 1955, has also made rapid strides.

C.T.C. is a method of signalling and train control whereby all the stations and crossing loops on a section of line are equipped with power signal installations, but the whole section of line is controlled from one point. The installation of C.T.C. is at present being undertaken over the Kamfersdam — Postmasburg, Hamilton —Springfontein, and Warmbad — Nylstroom section.

The Kamfersdam—Postmasburg section is 128 miles in length and comprises 22 stations. The control machine will be in the control office at Kimberley.

The first section, Kamfersdam — Wintersrush, was completed in September, and the whole section to Postmasburg will be complete by the end of the year. This scheme will be unique in that a device is being used to count the axles of the train as it enters and leaves a section between two stations. The cost of the installation is estimated at £905,250.

The Hamilton — Springfontein section is 88 miles in length and has 25 stations.

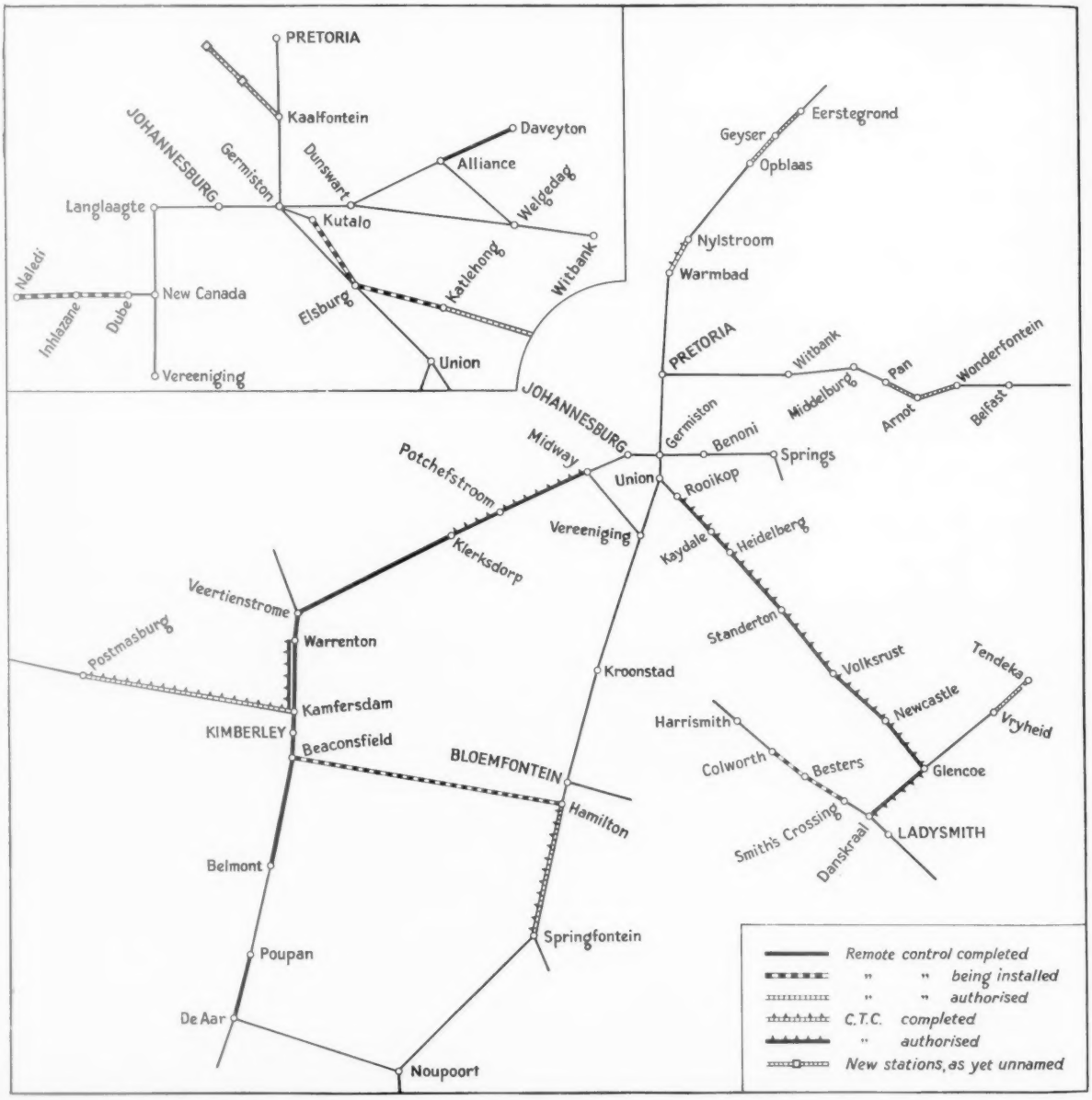
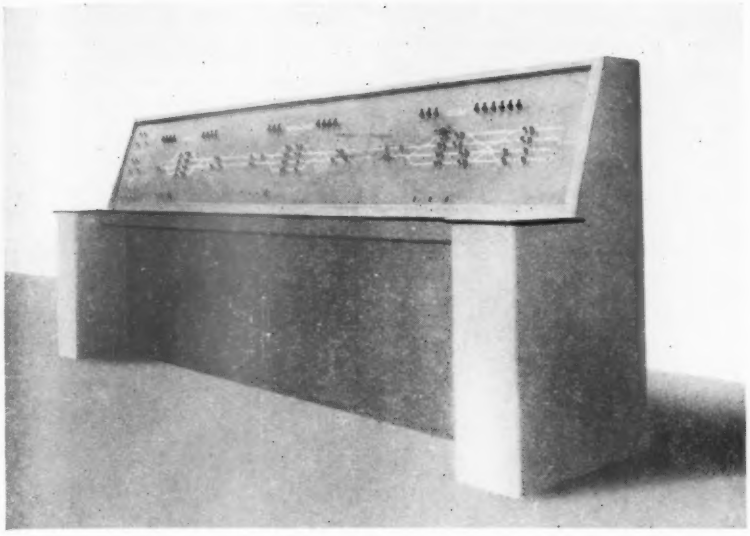


Diagram showing the various remote control and C.T.C. sections, and a new line to be constructed from Kaalfontein



Type "NX" route relay interlocking panel for the Dube—Naledi section

The control machine is to be located in the main control office at Bloemfontein. A power line is being installed between Bloemfontein and Springfontein, and sections of the track laid on steel sleepers are to be insulated and track circuits installed.

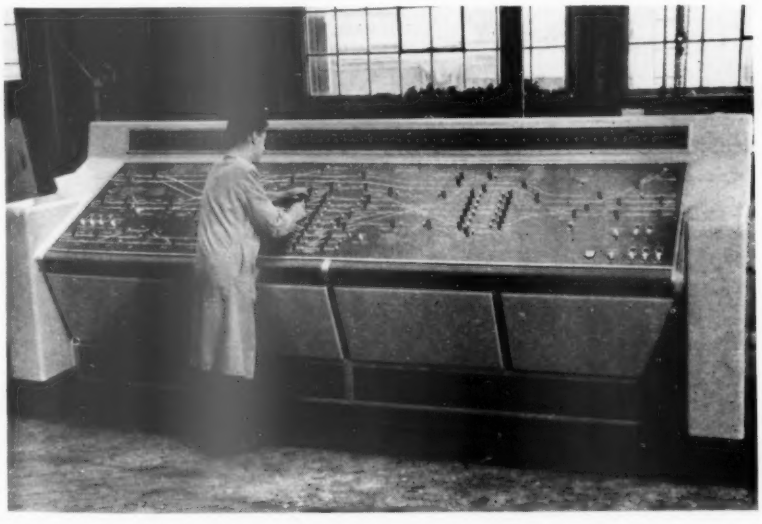
It is now intended that installation work shall commence early in 1960, and that it will be completed by the middle of 1961. The total cost will be £1,367,000.

The Warmbad—Nylstroom section is 18 miles in length with three intermediate stations. The control machine will be located at Warmbad. Track circuits will be used and the portion of the track laid on steel sleepers will be insulated. The work should be completed by the end of 1960 and the cost is estimated at £133,500.

In addition, the installation of C.T.C., at an estimated cost of £5,924,800, has been authorised for the Kamfersdam—Fourteen Streams, Midway — Klerksdorp, Rooikop — Volksrust, and Volksrust — Danskraal sections. Nine stations on a 45-mile section between Kamsferdam and Fourteen Streams will be controlled from Kimberley. The estimated cost is £630,000.

The Midway — Klerksdorp section which is electrified has 24 stations on a section of line 93 miles in length. The control will be from Potchefstroom, and the total cost is estimated at some £1,624,000.

Thirty stations on a 154-mile section between Rooikop and Volksrust will be controlled from Standerton, and the total cost will be some £1,532,000, while 23 stations on a 118-mile electrified section between Volksrust and Danskraal —including 38 miles of double track will be controlled from Glencoe. The cost is estimated at £2,138,800.



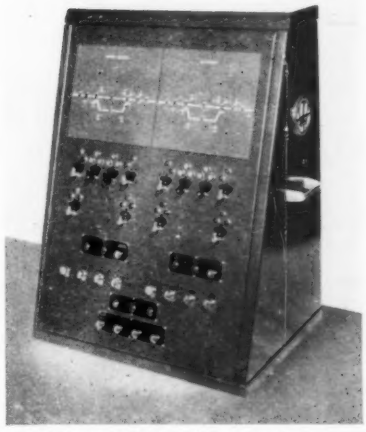
Pretoria console and diagram nearing completion at the Chippenham works of Westinghouse Brake & Signal Co. Ltd.

Remote Control

Remote Control, which is a modification of C.T.C. is a system whereby stations and unattended interloops are equipped with power signalling installations, including electrical operation of points, but are controlled from the adjacent attended stations. Isolated systems of remote control on a particular section of line can eventually be linked up into one C.T.C. system.

Control of Interloops

The remote control of interloops was first introduced on the South African Railways on June 7, 1955, on the Kimberley—Modderrivier section and was later extended to the Fourteen Streams—Warrenton — Kamfersdam — Kimberley sections. During the past year the sections Modderrivier — Belmont, Poupan — De Aar, and Klerksdorp — Fourteen Streams sections were equipped, which means that the South African Railways now has a continuous section of 338 miles from Klerksdorp to De Aar, on which all interloops are remotely controlled.



Control desk for interloops

Other sections on which work is in hand are Hamilton — Beaconsfield and Ladysmith — Brakwal, while contracts have also been placed for the Potgietersrus — Pietersburg, Middelburg—Belfast, and Tendeka — Vryheid sections.

Remote Control of Stations

In providing rail facilities to new non-European townships the South African Railway Administration is following a policy of keeping the number of European staff required at stations within the townships to a minimum. Station operating staff will not be provided and it is being arranged for these stations to be remote-controlled from the first station outside the township area.

One such new line to the settlement at Daveyton has already been introduced to traffic. Daveyton is a terminal station with four platforms and turn round facilities. It is connected by a double

line to Alliance from which station it is remote-controlled by a relay coding system.

A similar installation is under construction to serve the new township in the Natalspruit area. Here a new double line, 13 miles in length, is being constructed which will initially entail remote control of two stations and eventually a third. The control is to be from a new power signalling installation being provided at Elsburg. Terminal stations are being installed at Germiston and at Katlehong. The latter is the station within the township.

For the Western Native Townships near Johannesburg a new double line is under construction, and here two stations, Inhlazane, and Naledi, will be remote-controlled from Dube. The system of control to be employed here is known as Synchrostep and is a system of large capacity which has been specially developed for this type of control. The system is much faster in operation and should result in better working.

A similar installation is to be provided for the new township to be established in the Kaalfontein area. Here a double line is also to be constructed and two new stations are to be constructed.

In the Pretoria area yet a third system of remote control, developed for the control of single large stations, is being introduced. This is known as the Westronic system, and is a transistorised electronic system. With this system the transmission of controls and indications takes place simultaneously and is almost instantaneous. This is one of the very latest developments and has only just been introduced overseas. Two independent stations, Rissik and Capital Park East, are to be equipped with this form of control.

Equipment for the remote control installation at Dube is being supplied by Metropolitan-Vickers-GRS Limited, and the transistorised electronic installation in the Pretoria area by the Westinghouse Brake & Signal Co. Ltd.

Packaged Bricks in Railway Civil Engineering Work

Unloading from lorry and wheeling to site six times as fast as by hand

TO effect a considerable saving in time in the unloading of bricks and to ensure their arrival at site with a minimum of damage, many British brick companies are now supplying bricks in packs held together with steel straps. A typical pack consists of 45 bricks arranged in nine rows high of five headers, the packing and strapping costing about 15s. per 1,000 bricks.

To facilitate handling these packs a special hand barrow has been designed for use when loading and unloading wagons or lorries; a barrow load is one pack. For unloading from lorries a portable ramp is used, the barrow being braked when being wheeled down the ramp by special skids on it being pressed down on to the surface of the ramp. In order to have the barrow at the top of the ramp ready for loading the first few packs on to it the ramp is fitted with a short horizontal section at its top end forming a small platform.

Use with Crane

For loading or unloading by crane a special four-pack sling is used with hooks at both ends of four cross-bars engaging the straps which are sufficiently strong for this purpose, and having a safety factor of 4. When packs are to be lifted over the heads of men, however, a protective cage enclosing the packs must be used.

This type of pack and the other equipment described above have been in use by the Civil Engineering Department of British Railways, Western Region. For loading and unloading from wagon and lorry both in the depot and at lineside it has been found possible to unload with pack, barrow and ramp at six times the rate of unloading by hand with the same number of men.

Four-pack crane sling at West Ealing Depot

Specially designed barrow conveying 45-brick pack

RAILWAY NEWS SECTION

PERSONAL

Mr. M. W. Astle-Fletcher has been appointed Principal Scientific Officer, Electrical Engineering Department, British Railways Central Staff, British Transport Commission.

Mr. H. L. Hopkins, O.B.E., C.I.E., Chief Docks Manager, Hull Docks, British Transport Docks, who, as recorded in our September 11 issue, has retired, joined the North Eastern Railway as a clerk in 1919, and began a traffic apprenticeship in 1922. On completion of training in the Commercial & Operating Departments at York, Hull and Sunderland, Mr. Hopkins held appointments as Rates Clerk, District Goods Manager's Office, Hull; Assistant Yardmaster, Hull West; Yardmaster, Carlisle; Goods Agent, Leeds, and Goods Agent, Leicester. During the 1939-45 war he served with the Royal Engineers in France; in the Middle East, as Deputy Director of Docks, and in India, as Deputy Director of Transportation, attaining the rank of Colonel. For a time he was General Manager of the Port of Bombay. He received the O.B.E. and C.I.E. for war services. On demobilisation in 1946, Mr. Hopkins resumed his railway career as District Goods & Passenger Manager, Lincoln, and was subsequently appointed Portmaster, Grimsby & Immingham Docks, in September, 1947. In January, 1956, he became Assistant Chief Docks Manager, Humber Ports, and was appointed Chief Docks Manager, Hull Docks on October 1, 1956, the position from which he retired.

Mr. H. L. Hopkins

Chief Docks Manager, Hull, British Transport Commission, 1956-59

Mr. C. R. Wheeler has been appointed Chairman of the Guest Keen Iron & Steel Co. Ltd., a subsidiary of Guest Keen & Nettlefolds Limited. He succeeds Mr. K. S. Peacock, who, because of pressure of other commitments, has retired from the Chairmanship, but remains on the board.

Mr. H. M. Pearson, Assistant (Special Purposes), Chief Civil Engineer's Office, Waterloo, Southern Region, British Railways, has been appointed Assistant (Works), Civil Engineering Department, British Railways Central Staff, British Transport Commission.

We regret to record the death, on December 16, of Mr. E. S. Gellatly, District Operating Superintendent, Sheffield, Eastern Region, British Railways.

Sir Harold Emmerson has been appointed a Director of the Aldershot & District Traction Co. Ltd., in the place of the late Mr. W. P. Allen. Sir Harold Emmerson recently retired as Permanent Secretary, Ministry of Labour & National Service.

Sir Geoffrey Beazley has resigned from the Mersey Docks & Harbour Board. He was Senior Member of the Board, which he joined in 1928, and was Chairman from 1951 to 1954. He is Senior Partner in the Liverpool ship and insurance brokers, Gracie Beazley & Co. Ltd., and is Chairman of Reliance Marine Insurance Co. Ltd., and a Director of the Guardian Assurance Co. Ltd., and of the Liverpool Grain Storage & Transit Co. Ltd.

Mr. D. A. Harris, Assistant (Maintenance) in the Chief Civil Engineer's Office, Southern Region, British Railways, has been appointed District Engineer, Bangor, London Midland Region.

Mr. T. S. Roberts, Docks Manager, Middlesbrough & Hartlepool Docks, British Transport Docks, who, as recorded in our September 11 issue, has been appointed Chief Docks Manager, Hull, was educated at Cardiff High School and Balliol College, Oxford. Mr. Roberts joined the London & North Eastern Railway as a Traffic Apprentice in September, 1933. On completion of his training in the Commercial Operating and Locomotive Departments, he held various positions in Edinburgh and Glasgow. He was appointed Head of the Post-War Development Section at York, responsible for works matters for four traffic departments. He became Acting District Superintendent, Sunderland, in March, 1945, and was appointed District Goods & Dock Manager, West Hartlepool, in December, 1945. On the transfer of the Middlesbrough & Hartlepools Docks from railway ownership, Mr. Roberts became Docks Manager there on March 1, 1949, the post which he now vacates to take up his new appointment.

Mr. T. S. Roberts

Appointed Chief Docks Manager, Hull, British Transport Commission

Sir Cyril Hinshelwood has been re-elected President of the Royal Society. Other officers re-elected for the ensuing year are: Sir William Penny, Treasurer: Sir Lindor Brown, Biological Secretary; Sir William Hodge, Physical Secretary; Dr. H. G. Thornton, Foreign Secretary.

XUM

Mr. N. C. Macdiarmid, Managing Director of the Stanton Ironworks Co. Ltd., has been elected a Director of Stewarts and Lloyds Limited, the parent company.

Mr. F. R. Bond has been appointed a Director of Worthington-Simpson Limited. He retains his office as Secretary. Mr. H. D. Jenvey has been appointed Assistant Secretary.

Mr. K. Ramachandran, General Manager, Chittaranjan Locomotive Works, who, as recorded in our November 11 issue, is retiring, was born on March 2, 1903. He began his career in 1930 with the Bengal Nagpur Railway as a probationer in the Workshops, and became Acting District Locomotive & Carriage Superintendent in 1942, an appointment confirmed in October the following year. Mr. Ramachandran was appointed Deputy Chief Mechanical Engineer in March, 1947, and, in September of that year, was posted on special duty to the Railway Board as Chief Mechanical Engineer. In June, 1948, he became Chief Mechanical Engineer of the Bengal-Nagpur Railway, and, in April, 1952, Chief Mechanical Engineer of the Eastern Railway. In June, 1956, he was appointed an Additional Member (Mechanical), Railway Board, and the following year he became General Manager, Chittaranjan Locomotive Works, the position from which he now retires.

Mr. V. Southon has been appointed Chief Inside Sales Engineer & Office Manager, Toronto Office, E.C.C. (Canada) Limited, the Canadian organisation owned by the Electric Construction Co. Ltd. and George Ellison Limited.

Mr. D. E. Greenaway and Mr. W. J. Bonner have been appointed Directors of High Precision Equipment Limited, a member of the Associated Engineering group.

Mr. R. N. Bartley has been appointed North Eastern Counties Representative, Sir W. H. Bailey & Co. Ltd. Mr. Bartley will also be responsible for Scotland.

Mr. Lionel Harper, a member of the board of Massey-Ferguson Holdings Limited, has been appointed Assistant Managing Director in the newly established United Kingdom Operations Group.

Mr. H. P. Mott has been appointed an Associate Director of Lansing Bagnall Limited, and Mr. H. A. Richardson becomes an Associate Director of its subsidiary, J. E. Shay Limited. Mr. J. B. Peat has been appointed an Associate Director of both companies.

INSTITUTION OF RAILWAY SIGNAL ENGINEERS

The following names have been entered on, or transferred in, the register of members of the Institution of Railway Signal Engineers:—

Associate Member

Mr. J. Shenton, Senior Technical Assistant, Signal Engineer's Department, Crewe, London Midland Region, British Railways.

Associates

Mr. S. J. Morrish, Work Study Assistant, Signal Engineer's Department, Western Region, British Railways.

Mr. R. W. H. McCall, Chief Contracts Engineer, Telephone Manufacturing Co. Ltd.

Transfer Technician Member to Associate

Mr. R. J. Cyphus, Work Study Assistant, Bristol, Western Region, British Railways.

Mr. T. H. Laing and Mr. R. J. Badcock have been appointed Members of the Transport Users' Consultative Committee for the South-Western Area. They will represent agriculture.

Mr. Duncan M. Oppenheim has been appointed Chairman of the Council of Industrial Design. He succeeds Sir Walter Worboys who is retiring on January 31.

Mr. N. A. Qureishy, who, as recorded in our November 27 issue, has been appointed General Manager, North Western Railway, Pakistan, took up that appointment on October 1. He was recalled from Western Germany, where he was on deputation as Liaison Officer in connection with the construction and inspection of rolling stock for Pakistan Railways. Mr. Qureishy joined the N.W.R. as Assistant Mechanical Engineer in 1935, after receiving advanced training in the United Kingdom. He later worked as Assistant Works Manager, Works Manager, Divisional Mechanical Engineer and Statistical Officer. He also held charge as Deputy Chief Operating Superintendent, Deputy Chief Mechanical Engineer, and Superintendent Mechanical Workshops on the N.W.R., and Chief Mechanical Engineer, Eastern Bengal Railway. Mr. Qureishy went on deputation to the United Kingdom, in 1948, with the Stores Purchase Mission. He has been closely associated with the introduction and development of diesel-electric traction on the N.W.R. He went to the United States, 1950-51, to study workshop layouts and other facilities for maintenance and servicing of diesel-electric locomotives. In the same year he visited Egypt to study diesel traction in that country.

Mr. K. Ramachandran

General Manager of the Chittaranjan Locomotive Works, 1957-59

Mr. N. A. Qureishy

Appointed General Manager, North Western Railway, Pakistan

Mr. J. Dewar

Appointed District Operating Superintendent, Burntisland, Scottish Region

Mr. D. Beattie

Appointed District Commercial Manager, Leicester, L.M. Region

Mr. G. Wright

Appointed Goods Agent, Halifax, North Eastern Region

Mr. James Dewar, Assistant to the District Operating Superintendent, Burntisland, Scottish Region, British Railways, who, as recorded in our December 4 issue, has been appointed District Operating Superintendent, Burntisland, joined the former North British Railway, as a clerk at Whitburn station, in 1910. Having served at a number of stations he joined H.M. Forces during the 1914-18 war. He returned to Dunfermline Upper as a booking clerk and, in 1920, was appointed a relief clerk in the office of the District Traffic Superintendent, Dundee. Two years later he took up a similar position in the District Operating Superintendent's office, Burntisland, where he was later promoted to be District Inspector. In 1945 he became Chief Trains Clerk & Chief Controller, Burntisland, and in 1950 was appointed Assistant to the District Operating Superintendent. At the time of his appointment Mr. Dewar was occupying temporarily the position of District Operating Superintendent, in which he is now confirmed.

Mr. D. Beattie, District Commercial Officer, Norwich, Eastern Region, British Railways, who, as recorded in our September 11 issue, has been appointed District Commercial Manager, Leicester, London Midland Region, was educated at Lincoln County School and began his career in the London & North Eastern Railway in 1936. He obtained experience at Lincoln Goods Station until 1940, when he became a Lieutenant in the R.N.V.R. and served on convoy escort work and in the Normandy landings. In 1946 he was appointed a Traffic Apprentice and trained at Darlington, Middlesbrough, Newcastle, and York. In 1950, he moved to the Development Section of the Commercial Superintendent's Office at Glasgow and, in 1951, was appointed Goods Agent, Shieldhall. In 1952 he became Cartage Assistant to the District Goods and District Passenger Superintendents, Glasgow, and, in 1955, was appointed Assistant District Traffic Superintendent, Inverness. Mr. Beattie became Assistant District Commercial Manager, Derby, in 1956, and District Commercial Officer, Norwich, in January, 1958.

Mr. G. Wright, A.M.Inst.T., Assistant to District Goods Superintendent (Sales), Leeds, North Eastern Region, British Railways, who, as recorded in our December 11 issue, has been appointed Goods Agent, Halifax, joined the London Midland & Scottish Railway in 1942 at Burton-on-Trent. Subsequently joining the Royal Navy, he served as a Leading Writer on the staff of the Commander-in-Chief, Home Fleet. On demobilisation Mr. Wright returned to Burton-on-Trent and in 1952 was selected as a Traffic Apprentice. After a period of training he was appointed Goods Agent, Darwen, and later held similar positions at Radcliffe and Bury. In 1958 he was appointed Assistant to the District Goods Superintendent (Sales), Leeds, the position he now vacates. Mr. Wright is a member of the Huddersfield Chamber of Commerce.

Mr. E. W. Gain

Appointed Works & Building Engineer, London Transport Executive

Mr. F. S. P. Turner

Appointed Assistant New Works Engineer, London Transport Executive

Mr. P. B. Johnson

Appointed Modernisation Assistant, Leeds, North Eastern Region

Mr. J. Hancock
Appointed Commercial Officer, Liverpool Street, Eastern Region

Mr. J. O. Eaton
Appointed Staff & Organisation Assistant to Chief Civil Engineer, L.M. Region

Mr. H. Thompson
Appointed Stationmaster, York, N.E. Region

Mr. E. W. Gain, B.Sc. (Eng.), A.M.I.C.E., Principal New Works Assistant, London Transport Executive, who, as recorded in our November 6 issue, has been appointed an Officer of the Executive, with the title of Works & Building Engineer, graduated from King's College, London University, in 1926, with 1st Class Honours. In the same year he was awarded the King's College Diploma in Engineering. After a wide experience with public works contractors, he joined the London Passenger Transport Board, in 1935, as a Technical Assistant in the Chief Engineer's New Works Department. During the 1939-45 war he served in Port Construction & Repair Units, Royal Engineers, and was a Staff Captain, H.Q. Force 135, when demobilised in 1945. Since the war, Mr. Gain has been engaged on the extensions and improvements on the Underground system. He was appointed a Senior Executive Assistant in 1950, and a Principal Executive Assistant in 1954, when he became responsible for new civil engineering construction work. He was made Principal New Works Assistant in 1957.

Mr. F. S. P. Turner, A.M.I.C.E., Principal New Works Assistant, London Transport Executive, who, as recorded in our November 6 issue has been appointed an Officer of the Executive, with the title of Assistant New Works Engineer, joined the drawing office of the London Electric Railway in 1928. Between 1930 and 1939 he worked on the extension of the Piccadilly Line from Hammersmith to Northfields; the building of public subways at Monument and Whitechapel; station improvements at Aldgate East; special works connected with air-raid precautions, and on major war-damage repair works. In 1942 Mr. Turner was commissioned in the Royal Engineers, and later served in a Railway Bridging Company in Europe. He was mentioned in despatches and later served as Railway Bridging Officer, Control Commission, Germany. On return to London Transport in 1946, Mr. Turner led a team dealing with railway works ceased in 1939. In 1950 he was engaged on several tube tunnel enlargements. He was appointed a Senior Executive Assistant in 1951 and a Principal Executive Assistant in 1955. Since then he has been responsible for the planning of the proposed tube railway from Victoria to Walthamstow; planning and designing the new District Line rolling-stock depot at Upminster, and the track quadrupling and electrification work on the Metropolitan Line.

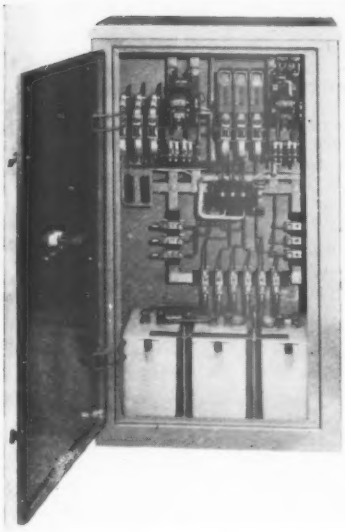
Mr. P. B. Johnson, Assistant District Traffic Superintendent, Newcastle, North Eastern Region, British Railways, who, as recorded in our November 20 issue, has been appointed Modernisation Assistant, Traffic Manager's Office, West Riding, Leeds, began his railway career with the Great Western Railway at Uxbridge Goods Office in 1929. During the 1939-45 war he served in the Royal Bucks Yeomanry and the Royal Indian Engineers. On demobilisation he joined in the Trains Office of the Divisional Superintendent, Paddington, and was later selected for two years' special training in the Traffic Department. He subsequently occupied various positions in the offices of the Superintendent of the Line at Paddington and, in 1949, was transferred to the Chief Commercial Manager's Department. Mr. Johnson moved to the North Eastern Region in 1955, as Indoor Assistant to the District Passenger Manager, Newcastle, and in 1957 was appointed Assistant District Passenger Superintendent, Newcastle, the position he vacated to take up his present appointment.

Mr. J. Hancock, B.Com., M.Inst.T., Commercial Superintendent in the office of the Line Traffic Manager (Great Northern), Kings Cross, Eastern Region, British Railways, who, as recorded in our November 13, issue, has been appointed Commercial Officer (Traffic Headquarters), Liverpool Street, Eastern Region, was educated at Archbishop Holgate's Grammar School, York, and joined the London & North Eastern Railway in the Divisional Stores Superintendent's office, Gateshead, in 1924. After a year's tour of Canada and the U.S.A. under a Sir Ernest Cassel travelling scholarship in 1931, he was appointed a Traffic Apprentice, L.N.E.R., and subsequently occupied positions at Kings Cross, Middlesbrough and York. During the 1939-45 war, Mr. Hancock was commissioned in the Royal Engineers (Movement Control), served in France and the Middle East as Deputy Assistant Director of Transportation with the rank of Major, and was mentioned in despatches. On his return to railway service, he became successively Head of the Traffic Section, Goods Manager's Office, Glasgow; Goods Agent, Stockton; Head of the Passenger Rates & Fares Section, York, and Assistant to Commercial Manager (Passenger), York. In 1956 Mr. Hancock was appointed Assistant to Commerical Manager (Passenger), Eastern Region, Liverpool Street, and, in November, 1957, became Commercial Superintendent in the office of the Line Traffic Manager (Great Northern), Kings Cross.

Mr. J. O. Eaton, who, as recorded in our November 6 issue, has been appointed Staff & Organisation Assistant to the Chief Civil Engineer, London Midland Region, British Railways, joined the Great Western Railway in the Divisional Engineer's Office, Shrewsbury, in 1921. In 1924 he was transferred to the Chief Civil Engineer's Office, Paddington, and served in the Accounts & Statistics Section and on the Staff Section. He was appointed Assistant Head of Staff Section in 1949, and in this capacity completed arrangements for the mechanisation of the Civil Engineering Department paybills. In 1950 Mr. Eaton was transferred to Plymouth as Chief Clerk to the District Engineer, and early in 1955 was seconded to the Chief Civil Engineer's Office, Paddington, to work with a consultant engaged on the investigation of clerical methods in the department. Later the same year he became Head of the Works Clerical Section, Paddington. On the formation of a Departmental Organisation & Methods Section, in 1956, he was made Head of the Office Methods Section, his last appointment before present promotion. Mr. Eaton is a member of the Office Management Association.

Mr. H. Thompson, Stationmaster, Middlesbrough, North Eastern Region, British Railways, who, as recorded in our September 18 issue, has been appointed Stationmaster, York, began his railway career with the London & North Eastern Railway, in 1923, as a Junior Clerk at Pelaw. He later served at a number of Tyneside stations and in the District Traffic and Control Offices at Newcastle, Sunderland and York. He was appointed Stationmaster at Pateley Bridge in 1946, and at Seaham & Seaham Harbour in 1950. Mr. Thompson was a Relief Stationmaster in the Sunderland District from 1952 until 1955, when he became Stationmaster at Middlesbrough, the appointment he recently relinquished.

NEW EQUIPMENT AND PROCESSES



Automatic Starter for Squirrel-Cage Motors

FOR squirrel cage a.c. motors up to 100 h.p. used for machine-tool drives in railway workshops and many other industrial purposes when the starting torque is heavy and the maximum current must be limited, the Startomatic starter is claimed to have several advantages over others of the primary-resistance type. It uses thermo-variable liquid resistances in place of fixed metallic resistances automatically to reduce the current peaks during starting. These need very little maintenance, cannot burn out, and only two standard sizes, of 2 litres and 5 litres capacity, cover all horse power and torque characteristics within the range available.

The Startomatic can be simply calibrated to provide the correct torque for any drive while giving smooth and continuous acceleration of the motor, so reducing mechanical stresses in the driven machine. The action of the resistance units is based on the reduction of the resistance of certain electrolytes when their temperature is raised. The reduction which occurs through this cause in the Startomatic equipment during the starting cycle is about 5 : 1.

A substantial dust-protecting sheet-steel case for wall or floor mounting encloses the line contactor, three resistance units (one in each phase), a short-circuiting contactor under time control, and triple-pole thermal overload protection. An arrangement for remote control is available. Each resistance unit consists of a reinforced polythene tank with two electrodes, the lower ends of which enter a thermal chamber of predetermined volume. For calibration purposes, it is possible to remove part of the insulation sleeves covering the electrodes, so varying the value of the initial liquid resistance. A safety feature claimed is that, in the event of an overload condition occurring, the torque of the motor is automatically increased up to the direct-switching value.

The relative simplicity of the apparatus enables it to be sold at a price which is stated to be competitive with or below that of alternative starters. For example, for a 40-h.p. motor on three phase 25/60 cycles supply, the price of a heavy-duty Startomatic starter similar to the one illustrated is £152 (380-550 V.) or £202 (200-250V.). Delivery of complete units can be made in 7-14 days. Further details may be obtained from Lee Guinness Limited, Newtownards, Northern Ireland.

Data Control for Jig Borer

THE Herbert Datatrol system for jig-less boring in medium and small batch production of locomotive gearbox casings, diesel engine cylinder housings, and so on, has been devised to control the positioning in sequence of spindle-head and table co-ordinates of the 2B-36 Herbert/DeVlieg Spiramatic Jigmil. This functions electronically in conjunction with the standard DeVlieg positioning cycle, in which no servo-motors are used, and is stated to achieve the same accuracy of 0·0001 in. per ft. As mentioned in our November 20 issue, it completely dispenses with any need for the provision and fitting of interchangeable measuring rods working in conjunction with micro-switches. With the Datatrol system the co-ordinate dimensions are pre-set by manual switches on a control panel or from punched readings on a five-channel paper tape coded in the binary-decimal system.

The equipment consists of a substantial control desk housing the dial and tape analogue control system and, in the machine bed and column, a series of fixed 10 in.-long Ferrand Inductosyn scales which are of glass printed with flat windings covering 360 electrical deg. every 0·1 in. A scale of similar construction but only 5 in. long and with two circuits, slides with each of the moving parts and is fed with analogue voltages. By inductive coupling an error voltage is produced in the fixed scale, and this is amplified by transistors and converted into a d.c. signal which initiates the positioning cycle and ceases when the slider has moved the correct distance from its datum point. Two rotary resolvers for each axis are geared at different ratios to the leadscrews to provide coarse and medium positioning signals for initial slide movements above 0·5 in. and 0·1 in. respectively. Electrical switching between these and the precision linear scales is automatic. Also there is a datum-shift unit which enables artificial zeros to be selected anywhere within the axis of the machine.

When setting-up for machining an individual workpiece, such as a jig requiring a high degree of precision, the hole co-ordinates can be pre-selected manually by a panel of rotary switches on the control desk, after which a button is pressed to pass the information into a store circuit. A number is illuminated on the desk identifying the co-ordinates held in store with the operational sequence on the boring chart. For repetition work the data for the machining programme are even more quickly and easily fed in by use of the tape-reading device. Subsequent operation of the automatic positioning button on the machine translates the stored information and causes the slides to make the required separate movements vertically and horizontally.

By the use of the 90 deg. indexing table with only one locating fixture, the Jigmil principle permits machining on up to four sides of a workpiece at one setting. Such work may include in-line bores for the majority of which no boring bar supports are needed. The Herbert Datatrol system is claimed to offer an extension of these advantages by reducing costly operator error and by making possible considerably higher rates of output.

The control desk is not normally supplied alone to existing users of standard Herbert/DeVlieg machines because of the nature of modifications needed to the latter. Further information may be obtained from Alfred Herbert Limited, Edgwick Works, Coventry.

Rear-Mounted Ripper

THE Ateco Ripper is hydraulically-operated and rear-mounted and will rip asphalt pavements to a 12-in. depth. It is for exclusive use on LeTourneau-Westinghouse 660 and 550 motor graders.

With accommodation for up to seven ripping shanks, the machine's rear mounting provides fast penetration and efficient ripping in the toughest material. The arrangement and ripping principle allows for much heavier ripping than that normally available through a front-mounted unit. Nevertheless, the ripper does not replace the front-mounted scarifier.

Attachments are available for various applications—straight or curved shanks, with steel or sphereulite replaceable points, splitter and shank guards, and a scoring disc for cutting asphalt pavements to limit the ripping area as required. A "hinge-away" action keeps points retracted when not in use.

Further details can be obtained from the manufacturer, the LeTourneau-Westinghouse Company, Peoria, Illinois.

Ministry of Transport Accident Report

Between Urmston and Trafford Park Stations, December 11, 1958: British Railways, London Midland Region

Colonel W. P. Reed, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 6.16 p.m. on December 11, 1958, between Urmston and Trafford Park, when the 5.30 p.m. up passenger express, Liverpool Central to Manchester Central, consisting of seven coaches drawn by a Class "MT" 2-6-4 tank engine, collided at speed with the jib of a contractors' mobile crane with its skip load of wet concrete. The crane had capsized on a road outside the railway boundary. The train became derailed and its engine overturned. Shortly after this the 6.5 p.m. passenger train, Manchester Central to Wigan, consisting of six coaches, drawn also by a Class "MT" tank engine, collided sidelong with the overturned one and became damaged but not derailed. One passenger, who had alighted on the down line, was killed; 37 others and the enginemen of both trains required treatment in hospital, but only two passengers and three enginemen were detained. Emergency services were called promptly, but work was hampered at first by lack of light; a temporary power cable had become severed. Both lines were restored to traffic at 3.45 p.m. the following day. It was dark, but fine and clear.

A new bridge over the line, half of which had been completed, was being built to replace an old one and the level of a road running along the top of a cutting was being raised. A substantial new retaining wall was being constructed and the crane being used to pour concrete into the shuttering. During this construction work a field telephone, connected to the signalboxes on each side, had been provided from time to time by the railway for the use of operating staff, making arrangement for the line to be closed during week-ends; this was in place when the accident happened.

Capsizing of Crane on Railway

The prime cause of the accident was an incident taking place outside the railway boundary, for which the railway authorities were not responsible. The contractors owning the crane were carrying out road works for the Lancashire County Council and by the terms of the contract the railway authorities had a right of supervision where the work might affect the line. Apart from that they were not concerned with it.

Colonel Reed had the working of the crane, which was rigged with a 50-ft. jib, explained to him, with the details of the ground on which it was working and other relevant particulars, with figures for designed load and other essential facts and data bearing on the mishap. Settlement of the responsibility for the capsizing of the crane was not within his province, and he makes reference to such matters only in so far as they seemed to him to be essential to the purposes of his report. He acknowledges therein the full co-operation he received from the contractors, the makers of the crane, the legal representatives of both, and the engineers of the Lancashire County Council, also represented at his inquiry.

Evidence of Railway Staff

The driver of the up train said he passed Urmston at 60-65 m.p.h. When his fireman shouted that there was a red light in front he made a full brake application and then saw a red light himself, after which they ran into the obstruction. This light presumably was one of two road lamps being carried by contractors' men who, it eventually appeared, had not gone as far along the line as they imagined. The driver had a copy of the weekly notice in which this stretch of line was shown as having work in progress but without a speed restriction being imposed. He had in fact overlooked this item but this did not affect the matter. The guard collected detonators and began walking along advising passengers to keep doors closed and not alight and then saw the down train approaching. After the second collision he went back towards Urmston to protect the line but did not meet anyone carrying a red lamp; he saw someone with a white one.

The driver of the down train sighted Urmston distant signal at caution and then they struck the overturned engine. His first thought was to put out the fire which he did with the help of volunteers who brought buckets of water. Later he collapsed and was taken to hospital. The evidence of the fireman and guard was to the same effect. The signalmen at Urmston and Trafford Park explained how the block and other circuits became broken as a result of the collision and in what way Control had been informed of it; the field telephone had a code call which could be used to call the attendant at the side when special working arrangements were in force.

The contractors' site foreman had ordered the crane into position and admitted that so long a jib was unnecessary; a 30 ft. one would have sufficed but the crane happened to be readily available. Its driver explained how he had controlled it and was unable to suggest how the accident happened. He did not think the filling under it had subsided, and in fact no apparent sign of such was found.

Such inspection and testing as were possible in its damaged state showed the crane to have been in good order. Evidence of various persons regarding events after its fall showed that endeavours were made to find the railway flagman—there was by then none there—and that from 5 to 10 min. elapsed before the collision. The foreman sent a man to telephone to the police and endeavoured to get the crane dragged clear.

Protective Arrangements

Colonel Reed had to give particular attention to the question of the protective arrangements in force during this engineering work. The contractors had to conform to the requirements of the British Transport Commission for its safe carrying out and the contract authorised its engineer or his representative to have free access to any premises where work was being done or materials prepared or manufactured. Arrangements for supervision had been made between the railway and the engineers of the County Council who called in the contractors as required, but in the day-to-day work the railway clerk of works dealt directly with the contractors' foreman; the Council had no site foreman. Meetings between those concerned were held before work began and about every fortnight between certain engineers to ascertain the kind of work to be carried out and enable the railway to make arrangements for its protection, as might prove necessary. The bridge work had been in progress for 10 weeks with intensification on foundations close to the line during the last fortnight.

A meeting had been held on November 11 to decide the method of erecting the first portion of the bridge and satisfactory arrangements were made for night line possessions at week-ends. The field telephone was installed and left connected for the last fortnight.

The railway district engineer's technical assistant had complained that he had not received the programme of work from the Council as asked for and explained what they themselves would do if carrying out such work. This had handicapped him in his discussions with the railway foremen at various sites under his supervision and with the Council's staff over day-to-day safety needs. The representatives of the Council pointed out that a programme had been sent leading to the meeting on November 11, but the reply was that this did not give enough details. The contractors' site engineer said a flagman had been appointed in July and had been there ever since. He understood the man was to be on duty during all hours of his men's work, if that was near the line, but did not consider work should stop in the flagman's absence if not near it. The railway officers said a lookout man had been appointed to protect men who had to cross the line, but not a hand signalman to protect trains if the line became fouled; the lookout's duty, however, included a watch on the work so far as it might affect the line and he was expected to stop it if necessary until protection had been provided. There seems to have been no specific arrangement for this man to use the field telephone in emergency.

Liaison with Contractors' Staff

The railway clerk of works visited the site nearly every day for two or three hours and gave evidence regarding his conversations with the contractors' staff and related matters. He did not think a crane on the road would have offered any danger if fitted with a 25-ft. jib. The lookout had been told to work to the hours the contractors worked, even to 8 or 9 p.m., and this was in force when he entered on his own inspection duties; on the day of the accident he arrived about 12.45 and spoke to the man.

The contractors' foreman understood the flagman to be required to be on the line all the time his men were working near it. The man had not, to his knowledge, ever gone on the road to see if their equipment was endangering the railway, but he had never dissuaded him from doing so; he did not think the man could have assessed the potentialities of any machine. He had himself told the clerk of works that his men were working until 9 p.m. every night that week.

The lookout was a man relieving the ordinary one that afternoon and said he arrived about 1 p.m., but felt ill later and announced that he was going home about 5.30; he was satisfied that the gangerman had stopped work near the line in time. At 5.40 men working close to the line had stopped; he was sure the men were packing up for the night. (His illness kept him away several days.)

Concerned primarily with the safety of the men, he knew how to use the field telephone in emergency. He had been told to stay until work stopped and on his three previous turns that had been until 6 p.m., but the gangerman contradicted some of this evidence, and said he told the lookout they would be working till 9 p.m. He understood him to have said that he would remain until then. He and other witnesses spoke

of seeing a lookout there in the morning, but the regular man said he did not turn up that day and Colonel Reed found in fact that no such man had been there.

Inspecting Officer's Conclusions

Colonel Reed is satisfied that the railway clerk of works was not told that the crane was to be used and had no reason to anticipate it; he did not fail in his duty and was not responsible for providing lookout men. The capsizing of the crane could have been due to a combination of some of a number of factors and there might have been some failure of equipment; no suggestion to this effect was made, however, nor evidence found. There was sufficient time to warn the up train so that at the very least speed could have been reduced appreciably. From the fact that little or no reduction was made it seems that the contractors' men did not get as far as they said. They are not blamed for it, however, they were not railwaymen and their first preoccupation would have been with their crane. The speed of the train is not criticised.

Had a railwayman been on watch he should have had sufficient time to warn the train. Even if not using the field telephone he surely would have set forth without delay and been able to warn the driver who might even then have stopped clear of the obstruction. Had the man been authorised to use the telephone he would undoubtedly have been able to warn the Urmston signalman in time.

Evidence regarding the action of the lookout man and his going early was conflicting, but Colonel Reed does not doubt that the work would have proceeded even had it been known that the man had left; he interpreted the contractors' attitude to be that they applied for a watchman and expected him to be there whenever they worked near the line and it was the railway's responsibility if he was not there to protect their men. They did not consider they were necessarily required to cease work in his absence, especially if other protective arrangements already had been made. When their work was outside railway limits they certainly would not have stopped for lack of such a man.

Colonel Reed considers that the man understood his dual responsibility of protecting the men from the trains and the line from obstruction but considers that for the latter responsibility the telephone should have been kept permanently there and the man instructed to use it immediately in emergencies. Allocation of men for the work appears to have been insufficiently organised, without clear supervisory arrangements, as the irregular and unnoticed behaviour of the regular lookout brings out.

Co-operation between railway, County Council engineers, and contractors was insufficient and the requirements of the railway engineers for detailed advanced planning of the work not satisfied by the day-to-day methods used and apparently accepted by the County engineers. Arrangements for work that obviously would obstruct the line seem to have been satisfactory but the railway considered they were not informed in sufficient detail of the programme of work adjacent to the line which might obstruct it. Though they registered dissatisfaction, firm action with the Council apparently was not taken. Colonel Reed is unable to say whether these requirements were reasonable or not, but is sure that with better co-operation there would have been better appreciation of the railway's problems and precious time not lost in taking warning measures when the crane fell.

Remarks and Recommendations

This accident was not investigated by an Inspector of Factories, because road work, on which the crane was being used, is not within such authority although bridge construction is, but the contractors readily acceded to an inspection of the damaged crane. An investigation might have established the reason for its fall, with salutary results. The railways are touched at many points by road development schemes but the management no longer insists on carrying out the bridge and connected road work which might affect the line as once it did; it therefore exercises no direct control over methods of execution. If the connected road work could be brought within the scope of the Factories Inspectorate by an extension of the Act, the standards laid down by the proposed regulations and supervision of the inspectors would add to safety.

It should be the duty of the railway watchman in these cases not only to protect contractors' men but to stop trains if the line becomes obstructed. Both men appointed did accept this dual responsibility, but were uncertain about the best method of stopping trains. This combination of responsibilities is not covered by the Rule Book and it is suggested that the duties might with advantage be given to watchmen in writing, with brief instructions how to carry them out and report difficulties. On busy lines a telephone to the signalbox with readily recognisable call sign is of more immediate value than hand signals and detonators and, it is suggested, should be provided where appropriate. Arrangements to this effect have been put in hand in the London Midland Region; the unsatisfactory aspects of the arrangements for providing watchmen also are being reviewed.

Working periods at the site shown in the printed notice as 8 a.m. to 5 p.m., were not realistic; the contractors frequently worked to a later hour. Such notices should cover all likely hours of work.

The circumstances of this accident give ground for reviewing the advisability of adopting flares on British Railways. The bright warning glare should give immediate partial protection, while an obstruction is being reported and more permanent arrangements made. Had the up train crew had flares it is likely that the down train would have been warned, the driver at least have been able to whistle and the passenger who was killed to get out of its path. The guard certainly would have had time to place flares before walking along his train and these should have been seen by the other one. Flares cannot of course be seen at a distance in thick fog and their value where curvature is heavy is less; nevertheless, there are many kinds of emergency in which they would add to safety. They ought to be available to watchmen on bridge work such as this. Colonel Reed suggests therefore that the question of their adoption be examined afresh.

English Electric Co. Ltd. Activities in 1959

First repeat orders for suburban a.c. traction equipment for British Railways

A review by the English Electric Co. Ltd. of activities in 1959 points out that the English Electric Group of Companies is continuing to play a leading rôle in implementation and modernisation of British Railways. The group is supplying complete main line diesel-electric locomotives of all five British Railways standard types and is the only manufacturer to do so. These locomotives are rated at 1,000, 1,100, 1,750, 2,000, and 3,300 h.p. and are of Types 1, 2, 3, 4, and 5 respectively. The last-named is fitted with Napier "Deltic" engines. A.c. electric locomotives, and power equipments for diesel-electric shunting locomotives, diesel-electric, and multiple-unit a.c. electric trains, also are under construction.

The first multiple-unit train for British Railways a.c. electrified lines entered service early in 1959 on the Colchester-Clacton-Walton line of the Eastern Region. This train was equipped by English Electric and has been followed into service by others of the same type. A regular passenger service by these units has been operated since April. The company has since received a repeat order for a further 42 suburban type a.c. multiple unit train equipments, the first repeat order to be placed by the B.T.C. for this type of equipment. The new train units will incorporate silicon rectifiers in place of the mercury-arc rectifiers with which the existing trains are equipped.

Although increasing competition is being met in export markets, orders were received in 1959 for electric and diesel-electric traction equipment for the Sudan, South Africa, Australia, and Poland, and locomotives were exported to Argentina, South Africa, and Ghana.

Generating Plant

English Electric diesel-alternator sets have been ordered for service throughout the world. The year has seen the opening of additional manufacturing facilities which will increase capacity for the production of gas turbines. They include a permanent test area fully equipped for full-load testing of gas turbines up to 8,000 kW. rating. One of the berths is at present occupied by the first production EM85 gas turbine, which is undergoing proving tests before dispatch to the Middle East. Production of the EM27 unit with a rating range of 2,300-3,000 b.h.p. has continued and during the year turbines of this type have been shipped to Canada, Sarawak, and Indonesia. The increased production capacity has enabled deliveries for this size of turbine to be improved.

Computers

Development and improvement of the DEUCE computers continued. Progress was made in production of the LACE Analogue Mark II computer equipment.

Considerable strides have been made in packaged unit construction, taking advantage of new techniques in transistorised development. Packaged units are now available which form a basis for both special purpose computers and computers associated with process control system operation. A significant order has been secured for a multiple-point temperature scanning and monitoring equipment for the United Kingdom Atomic Energy Authority, Calder Hall.

In October the announcement was made of the new KDP.10 expansible data processing system, intended primarily for commercial data processing where large volumes of input/output information have to be dealt with. It is not a competitor to DEUCE but will, in fact, take over the commercial data processing market at a point where DEUCE would be uneconomic for further expansion.

Switchgear has also been commissioned in many countries throughout the world. Repeat orders have been received from customers at home or overseas for new switching stations and extensions to existing installations An engineering development during the year has been the extension of

the English Electric Type OKM4 single-tank 33-kV. outdoor oil circuit-breakers to cover a rating of 1,000 MVA. at 22 kV.

Fusegear

Fusegear products introduced during 1959 included a new range of Combination fuse-switches with positive flag indication specifically developed to meet a British Railways specification but now being adopted by heavy industries, and a new double-break heavy-current isolator to meet increasing industrial loads. Orders were obtained for two new designs of open-type sub-station distribution fusegear for the electricity supply industry, and also for a new range of light-weight high rupturing capacity fuse links for use in aircraft.

Converters

Commercial introduction has taken place of English Electric silicon rectifiers. The silicon cell, which has been under development for a considerable time, is air-cooled and hermetically sealed, and incorporates a porcelain insulator to provide strength and long insulation paths. The high current and voltage rating of the cell makes it particularly suitable for industrial rectifier equipments with large outputs where compactness and high efficiency are of prime importance.

A number of orders for silicon rectifier equipments was received during the year, with applications ranging from battery charging to general dockyard and factory supplies. Of special interest is a 1,100 kW. equipment to provide the excitation of a 120 MW. alternator being supplied by the company for the Central Electricity Generating Board Belvedere power station, and 42 equipments totalling 35,500 kW. for supplying the traction motors in British Railways motor coach multiple-unit trains.

The company has maintained its leadership in the application of mercury-arc converters in the steel industry, equipment ordered including 8,400 kW. for the first converter-fed twin-drive reversing mill in Britain, and other converters for hot reversing mills, a skin pass mill and for non-reversing drives.

Other mercury-arc converters ordered included equipments for underground and surface traction, high voltage rectifiers for radio transmitters and equipments for various duties in industrial plants.

Meters, Relays, and Instruments

Considerable research has been carried out over the past three years to evolve the most efficient layout and equipment to produce high accuracy meters. This has culminated in the introduction of completely new assembly and calibration methods. In addition special purpose equipment has been developed in conjunction with machine-tool manufacturers for the economic production of high-grade components. The facilities now available within the English Electric Co. Ltd. for the production of single-phase meters are claimed to be amongst the most modern in the world.

During 1959 the variety of instruments manufactured has been further increased. To the 90-deg. moving-coil Miniature range the moving-iron movement has now been added. These have the same dimensions as the previous range, and comply in every respect with B.S.89: 1954, Industrial Grade. In addition to the 90-deg. conventional switchboard instruments, 240-deg. instruments in three movement types, moving coil, moving iron and dynamometer, are now made. Again the 240-deg. switchboard instrument cases have the same dimensions as the 90-deg. counterpart and it is therefore possible to use the 240-deg. instruments on existing panels fitted with the 90-deg. type. These 240-deg. instruments have been very successful in North and South American markets, and in the United Kingdom.

Similarly the range of high mechanical-stability traction instruments, 90-deg. type, has been extended by the introduction of the 240-deg. traction movement. These instruments have special edge-on illumination of Perspex platform dials which has been approved on British Transport Commission contracts.

The output rate of relays has been higher than for any previous year. Increased facilities and improved methods have resulted in greatly reduced delivery periods and made it possible to stock relays of the more commonly demanded forms for immediate delivery.

Expansion of the range of products has also continued, and these now include a relay for unit protection of plain feeders, employing the use of private pilot wires in a circulating current system. Lines up to 40 miles in length can be catered for and the system employed will provide simultaneous tripping of circuit-breakers at both ends of the protected feeder under the condition of a single-end feed. The relay element and all associated equipment for each end of the feeder is accommodated in one draw-out case with dimensions of approximately 14 x 7 x 7 in. The relay has a high through-fault stability factor of 40 times the operating current.

Increased Breaking Capacity of Relay Contacts

Other additions to the range include small, high-stability tripping relays with high duty "cut-off" contacts, and a "trip" and "close" interposing relay, type VAWA, which conforms to the Central Electricity Generating Board light current guide for high duty contacts. The type of high duty contact developed for these relays makes use of a small permanent magnet which assists in "arc extinction." If an arc is developed at the contact tips the effect of the permanent magnet field is to project it out onto more widely spaced arcing horns where the gap is sufficiently large to cause extinction. Applied to relays this method is unique and considerably increases the breaking capacity of the standard type of contact.

Electrical Drives

Activities during 1959 have covered a wide range of applications for all classes of rotating electrical machines for home and overseas.

Extension of A.W.S. in Eastern Region

British Railways, Eastern Region, states that the largest element of the work at present in hand on the installation of A.W.S. (automatic warning system, formerly known as automatic train control) ground equipment on the running lines between Kings Cross and Shaftholme Junction, north of Doncaster, is expected to be completed about the end of this year. In East Anglia, ground equipment has recently been provided on the electrified lines between Colchester and Clacton and Walton.

A further stage of the scheme includes the suburban lines from Liverpool Street to Enfield Town, Chingford, Hertford East, and Bishops Stortford which, with the line between Liverpool Street and Shenfield, will be equipped during 1960.

The London, Tilbury & Southend Line from Fenchurch Street to Shoeburyness, will be equipped by June, 1961, and by the end of that year ground equipment will have been provided between Shenfield and Colchester and Shenfield and Southend Victoria.

Equipment of locomotives and multiple-unit trains using these lines with the necessary apparatus is in hand.

Wherever possible the extension of A.W.S. is being carried out at the same time as the lines are re-signalled for electric services.

The Eastern Region schemes are part of the British Transport Commission five-year plan to introduce A.W.S. on the more important lines by the end of 1962. This plan will be followed by a further programme for the provision of A.W.S. on other suitable sections.

Crane Replacement at Parkeston Quay

The first stage in the task of replacing 31 wharf cranes at Parkeston Quay, Harwich, will be undertaken by Eastern Region of British Railways during 1960. The need for this new installation has been brought about by two major factors: first, the steady increase in the amount of cargo handled at the quay-side; secondly, a recent on the spot survey which established that 23 of the cranes now in service would reach the end of their useful lives in 1960; the remainder, four years later.

The full complement of cranes at present in use at Parkeston Quay is as follows: East Quay, 12 30-cwt. cranes, installed 1930; five 5-ton (1930); one 5-ton (1907); one 30-ton (1893). West Quay, three 5-ton and nine 30-cwt. (1934). Ten of these cranes, three 5-ton and seven 3-cwt., are included in the first stage of the scheme. They will be replaced by two 10-ton cranes, three 7/7½-ton, and five 3-ton, after which further replacements will be planned bearing in mind any changes in the volume and character of the traffic handled.

Increase in Cargo

During the past 10 years there has been a steady increase in the amount of cargo handled at Parkeston Quay. The numbers of accompanied cars and loaded containers, for example, have both doubled during this period; rising in 1958 to 18,478 and 10,587, respectively. Moreover, the current level of cargo tonnage is about one-third higher than at this time last year. This relatively sharp increase in traffic is partly due to better and faster handling of cargo, arising from mechanisation and reorganisation of shore labour. The effect of these measures and the added attraction of two new cargo vessels, the *Isle of Ely* and the *Colchester*, has also tended to produce more traffic. Ten-ton cranes are particularly necessary for the largest types of container, which are being carried in ever-increasing numbers by the new vessels on the Rotterdam and Antwerp services.

Cranes of appropriate capacity are also necessary to deal with other containers which, although designed for pay-loads of 5-tons, have gross weights of between 7 and 7½-tons. The quick and economical discharge of palletised traffic, often in units of about 20 cwt. calls for cranes of higher capacity than the existing ones. So, also do some of the heavier cars which have now to be transported.

The new improvements at Parkeston Quay will bring about faster and more efficient handling of cargo *en route* for the Continent, although rather fewer cranes will be in use.

AMALGAMATION OF BELGIAN COMPANIES.—The name chosen for the present by the five Belgian companies which have amalgamated, as recorded in our November 13 issue, is Ateliers Belges Reunis (A.B.R.). Correspondence should be addressed to 41, Rue de Manage, Familleureux.

Questions in Parliament

Demolition of Euston Doric Arch

Mr. Woodrow Wyatt (Bosworth—Lab.) on December 11, asked Mr. R. A. Butler, as Leader of the House, whether he would find time before Christmas or after the recess to debate the request by the B.T.C. for immediate permission to pull down the Doric arch and the Great Hall of Euston Station, "despite the fact that this was the first railway station ever built in any capital city and that it is listed as an historical monument."

Mr. Butler: That is one of the problems of the nationalised industries to which we should pay attention.

Parliamentary Notes

Railways to Relieve Road Congestion

Many suggestions for using the railways to relieve road congestion were made in the House of Commons debate on traffic congestion on December 10.

Mr. Ernest Marples, Minister of Transport, stated that there would be off-street parking, and intimated that he was negotiating with British Railways to ensure that, on the periphery of London and other places, adequate car parks were provided, so that people could come into the centre by public transport.

Mr. Frank Tomney (Hammersmith N.—Lab.) said that before major projects were considered, the investment programme should be discussed with the B.T.C. and, in London, London Transport Executive. For instance, the Victoria Line tube scheme would be not only cheaper by half compared with an urban motorway, but also would give a much better return "for our money."

"We shall not get a proper system of transport unless we fully consider one of the nation's most valuable assets—its railway system," he went on. "The railways have been starved of capital development for almost the whole life of the system . . . With the help of research officers, economists, and industrialists, surely we can now find out what proportion of the nation's traffic should be carried by rail. For example, surely heavy bulk liquids, heavy steel joists, and heavy minerals should go by rail . . . Our road system was not designed for that traffic. The industries concerned, the shipping companies and the B.T.C. must find ways of encouraging transport by rail of those goods which ought to be carried by rail. Until that comes about, we shall never have a completely integrated system which the country ought to demand and which we as legislators should see it gets. The Minister must do something to put back on to the railways the large volume of goods that should rightly and justifiably be carried by them."

Mr. E. Popplewell (Newcastle-upon-Tyne W.—Lab.) said that in 1922, 18 million tons of goods was carried on the roads and 23 million by rail. Today about 23 million tons of freight was carried by road and only 18,400,000 tons by rail.

"What a ridiculous situation we are in," Mr. Popplewell added. "Everyone acknowledges that we must have a railway system, but the free-for-all policy of the Government has encouraged the stifling of the railways. That has been accentuated by its policy of de-nationalisation of road haulage, which has assisted in strangling the railway system." The railways, he added, were losing £89 million. The road system was costing the nation £500 million.

Mr. Frank McLeavy (Bradford E.—Lab.) said that the cause of the present congestion was the ever-growing volume of traffic, lack of suitable roads, and the decline in the use of the railways.

"We are spending vast sums on road construction and repair, yet we expect the railways to be the only transport undertaking," Mr. McLeavy continued, "to finance their own road and traffic signalling system." A preposterous situation had developed.

Why could they not accept the cost of the maintenance of tracks and signalling on the railways as defence expenditure, and relieve the railways of their heavy debt? There was a big future for the extension of the road-rail system. The Minister should call a conference of industrial associations to discuss this. The railways had buildings idle at present which could be used as Regional depots.

Railways Backbone of Transport

Mr. Ray Gunter (Southwark—Lab.) said he could not see that a modernised, efficient diesel-worked or electrified railway system could be anything but the real backbone of the whole transport industry. Despite all the appalling difficulties with which it had been faced on the railway side, the B.T.C. had done a magnificent job.

"The pattern for a smaller but more efficient railway system is emerging at present," he added. The more rapidly they could have the railway industry modernised and efficient, the better for the nation. Given a fair chance, he believed that the modern railways could "claw back from the roads much of the heavier loads that are now jamming our highways."

B.T.C. "Best Employer in Country"

He could not imagine that the nation would desire that all unremunerative services should be ruthlessly obliterated, but if British Railways were to play the tremendous part in the future which they ought to play in the solution of national traffic problems, the Government must face the Commission's financial position. The B.T.C., with which he had spent his life negotiating, so far as lay within its power was the best employer in the country.

"The Commission has enabled us," he continued, "to work out the best redundancy agreements in the country. It has done many things for joint consultation. It is hard, indeed, for men of honour like Sir Brian Robertson and other members of the Commission that they are unable to make improvements in the salaries, wages and conditions of their workpeople which they know to be justified. The unions were willing to play their part with the Commission in helping the Minister to solve transport problems. We hope that he will help the Commission to meet the justifiable demands of our people, for pride of craft still remains with many railwaymen."

Mr. R. Gresham Cooke (Twickenham—C.) said that as a long-term solution of street congestion in London, "we would be justified in starting the Victoria to Walthamstow tube." The traffic carried by that line would be equivalent to a 14-lane highway in London.

Free Travel for All

Mr. Ron Ledger (Romford—Lab.) suggested to the Minister that there should be no payment for travelling on the railways. He said this was not so funny as it sounded. The cost of congestion was over £630 million a year, and it was increasing at 14 per cent a year. Railway receipts from passengers amounted to £165 million a year. Surely, it was reasonable that the Government should pay £165 million to London Transport and British Railways, and induce people in large numbers to come into London on the public transport rather than by their own cars. In favour of his suggestion was that roads would be freer for industrial goods which, delivered more freely and quickly, would reduce the cost of transport and therefore reduce the cost of the goods. If travel on the railways was free, the cost of printing tickets would disappear. The staff employed at present on issuing and collecting tickets could be used for the vital job of making the services much more efficient.

He stressed that he had discussed this proposal with men concerned with the movement of traffic. They considered that it was feasible. If the Minister was interested in suggestions being made from the Labour side, this was one which could be put into operation very quickly and would have immediate effect on congestion in all large cities.

Mr. Ronald Russell (Wembley South—C.) said there was plenty of railway siding space over which it should be possible to build car parks without interfering very much with railway operations. He gathered that the cost of building car parks over railways was heavy, but much more use could be made of railway space if there were real determination to do it. He was glad that the B.T.C. was, apparently, thinking on these lines.

Mr. Robert Mellish (Bermondsey—Lab.) said that if it was the argument that the B.T.C. must be run on an entirely commercial basis and show a profit at the end of the day, he warned the nation, and certainly the Minister, that it had no future. The bus and train services would deteriorate and not improve in such conditions. They must get the Government to understand that the Commission provided a public service essential to the country. If the Commission must find £40 million by withdrawing all uneconomic units, then the Minister should take the blame and the responsibility for the hardship which the withdrawal of the routes would create.

Victoria Line Tube

The Victoria to Walthamstow tube scheme had been "kicking around" since 1948. The Labour Government had been in office for nine years, but they had nine years of Conservative Government and the scheme had not been started. Everyone who knew agreed that that tube would be a great help in easing traffic congestion in London.

Mr. John Hay, Joint Parliamentary Secretary to the Ministry of Transport, said he was interested in the popular suggestion that everyone in the country should have free railway travel. They would look into what Mr. Ledger had said, and would certainly look at every suggestion that had been made.

The report on the Victoria Line, Mr. Hay stated, was now in the Minister's hands, and was to be published soon.

Staff and Labour Matters

B.T.C. Attitude to Union Membership

The following is the text of a message which the Chairman of the British Transport Commission issued to the Commission's staff on December 14 in connection with the question of trade union membership:

"I should like every member of the staff to know that the Commission attaches great importance to being able, through the agreed machinery, to settle with the trade unions all matters which bear on the interests of the staff. I also wish to acknowledge the assistance and co-operation accorded by the trade unions to the Commission in dealing with the problems of our industry.

"It is the policy of the Commission to give all facilities and encouragement to the staff to join their appropriate trade union and, while this is a matter for each individual to decide, the attention of all existing staff and new entrants to the service is drawn to the

desirability of trade union membership and to the facilities accorded to the staff through the recognised channels for expressing their views on all matters affecting their employment and welfare."

Contracts and Tenders

The British Transport Commission has placed an order with the Yorkshire Engine Co. Ltd., Sheffield, a subsidiary of The United Steel Companies Limited, for the supply of 10 170-h.p. diesel-hydraulic shunting locomotives. Delivery will take place in 1960. The locomotives will be used on the London Midland Region of British Railways, principally in the Manchester and Liverpool dock areas. This is the company's first order for diesel locomotives as main contractor to the B.T.C., although it erected 10 800-h.p. diesel-electric locomotives as sub-contractors to The British Thomson-Houston Co. Ltd. in 1957-58, and has built many steam locomotives for British Railways. The 170-h.p. diesel-hydraulic locomotive has been developed in collaboration with Rolls-Royce.

The Western Region of British Railways has placed an order with the Atlas Engineering Company for one Atlas wheel profiling machine for installation at Plymouth.

The Special Register Information Service Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Portuguese East Africa:

200 pairs of fishplates for 30 kg. rails
1,500 rail bolts with nuts and spring washers for 30 kg. rails
100 kg. of spring washers, ¾ in., for 30 kg. rails A.S.C.E. type
200 kg. of ¾ in. x 6 in. hexagonal bolts, nuts, and spring washers
200 kg. of ¾ in. x 7 in. hexagonal bolts, nuts, and spring washers
100 kg. of ¾ in. x 7½ in. hexagonal bolts, nuts, and spring washers
100 kg. of ¾ in. x 8 in. hexagonal bolts, nuts and spring washers
3 sets of points, complete, for 40 kg. rails 1: 11, left
3 sets of points, complete, for 40 kg. rails 1: 11, right
3 sets of points, complete for 40 kg. rails 1: 9, left
3 sets of points, complete, for 40 kg. rails 1: 9, right
10 frogs, 1: 11, manganese steel, for 40 kg. rails, low section.

The issuing authority is the Ports Railways & Transport Department, Lourenco Marques. The tender No. is 1/60. Bids should be accompanied by a deposit of Esc. 11,000 for rail bolts, fishplates, and protectors; Esc. 17,500 for rails; Esc. 36,000 for points; and Esc. 2,000 for frogs. The closing date is January 27, 1960. These items are additional to those called for in October, details of which were recorded in our issue of October 30, 1959. The Board of Trade reference is ESB/24934/59.

From Costa Rica:

840 steel ribs for tunnels
60 *tonnes* of 40-lb. rails in 10 yd. lengths
65 kegs (200 lb. each keg) of rail spikes ½ in. x 4 in.
12 complete switch points.

Bids should be submitted in a sealed envelope marked "Instituto Costarricense de Electricidad–Licitacion Public No. 433," addressed to La Proveeduria, Instituto Costarricense de Electricidad, San Jose. The closing date is January 15, 1960. Quotations must be c. & f. Puntarenas or Port Limon, firm prices. Delivery dates must be understood as delivery at a Costa Rican port. Offers indicating delivery ex. works will be rejected. The Board of Trade reference is ESB/29124/59.

Further details relating to the above tenders together with photo-copies of tender documents can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

Notes and News

Sao Paulo-Rio Grande Railway.—The Brazilian and French Governments have nominated the arbitrators, under the terms of the Arbitration Agreement of April 16, 1958, to establish the price to be paid for the 5 per cent bonds of the Companhia Estrada de Ferro Sao Paulo Rio Grande, whose undertaking has been taken over by the Government of Brazil.

Institution of Railway Signal Engineers.—In the report in our December 11 issue on the meeting of the Institution of Railway Signal Engineers at which Mr. E. G. Brentnall read his paper "Lifting Barriers at Level Crossings," Colonel D. McMullen was wrongly recorded, on page 552, as stating that "it was quite possible to get this fine timing with manual operation." The word "possible" should read "impossible."

Railway Benevolent Institution Grants.—At a recent meeting of the Board of the Railway Benevolent Institution, annuities were granted to four widows and three members involving an additional liability of £158 8s. a year. To meet cases of immediate necessity 137 gratuities amounting to £1,301 were also granted. Grants made from the casualty fund during the month of November amounted to £1,406 1s.

Western Region Christmas Arrangements.—The Western Region of British Railways is running 300 extra long distance trains throughout the Region during the Christmas holiday period, December 23-28. A total of 78 will depart from Paddington. There will be 93 extra trains coming into Paddington, with December 27 the busiest day when 41 extra trains are scheduled to arrive. On cross-country routes 136 extra trains have been arranged. A normal Sunday service is in operation today (December 25), tomorrow, and Sunday. Christmas day specials have been arranged for branch lines not normally opened on Sunday to give connections from long-distance overnight trains. One extra sailing was made from Fishguard to Rosslare on December 23, but sailings in both directions have been cancelled for tomorrow.

Collision at Victoria Station, Southern Region.—An electric train from Epsom running into platform 16 at Victoria Station, British Railways, Southern Region, on December 15, collided with five parcels vans being unloaded there. Eleven people were injured; five of them were taken to hospital. Some windows in the train were broken, and one of the vans was derailed.

Car Park Over Railway Lines Proposed.—The highways committee at Richmond, Surrey, is to ask the Ministry of Transport to allow Richmond Borough Council to roof over the railway lines between Richmond Station bridge and the next bridge at Church Road, Richmond, to provide two-tier parking facilities above the lines. Because the track at this point is well below street level access to such a car park would be directly from the streets surrounding it.

London Commercial Service Christmas Party.—Mr. H. A. Yates, and members of the London Commercial Service, British Railways, held their Christmas party at the National Provincial Bank Buildings, London, E.C.1, on December 17. This informal function was well attended by some 350 guests, representing a wide range of suppliers and manufacturers who have, during the course of the year, made use of British Railways goods services.

Minister of Transport Visits Eastern Region Installations.—The Minister of Transport, Mr. Ernest Marples, recently visited installations in British Railways, Eastern Region. The illustration shows him in the hump cabin at Temple Mills New Marshalling Yard with the Chairman of the British Transport Commission. (Left to right): Sir Brian Robertson; Mr. H. W. Few, Traffic Manager (Liverpool Street); Mr. H. B. Onyon, Yardmaster; Mr. Marples;

Mr. Ernest Marples with Sir Brian Robertson in the hump cabin at Temple Mills Marshalling Yard, Eastern Region

Mr. T. G. Gibb, General Manager, British Road Services; and (extreme right), Mr. W. G. Thorpe, Line Traffic Manager (Great Eastern), Eastern Region.

Canadian Pacific Railway Preference Dividend.—The Canadian Pacific Railway Company is to pay a final dividend of 2 per cent on the preference stock in respect of the year 1959.

Reducing Flange-wear on Bogie Locomotives.—In the first paragraph of our editorial article in last week's issue concerning Mr. W. L. Topham's paper on flange-wear, the third sentence should begin: "Also the bogie or pony-truck wheels. . . ." The word "on" was printed in error.

York Station Christmas Tree.—Mr. W. Louis Lawton, Chairman of the York "A" & Tadcaster Hospital Management Committee, officially inaugurated the York Station Christmas Tree at a ceremony held recently in the station concourse. Mr. H. A. Short, General Manager, British Railways, North Eastern Region, presided. Those present included Mr. L. M. Sayers, Assistant General Manager (Administration) of the Region.

Eastern Region Carol Concert.—Members of railway choirs from Lincoln, London, and Sheffield, British Railways, Eastern Region, presented a carol concert at the Guildhall, London, on December 18. The Eastern Region Musical Society London orchestra and guest artists took part in the programme. The conductor was Alan Gore-Harvey; associate conductor, Herbert Shelbourn; and leader of the orchestra, Arthur E. Barker. The soloists were Ruth Stevens, contralto; Jean Dodd, soprano; John Wakefield, tenor; and David Bowman, bass.

Extra Trains in the L.M. Region for Christmas Holidays.—British Railways, London Midland Region, is running 604 extra main-line trains during the Christmas holiday period. A total of 229 extras are being run to and from Euston, the Midlands and the North; 96 to and from St. Pancras; and 10 to and from Marylebone Station. Yesterday was the peak day when 176 extra trains ran in the Region; Sunday will be the peak day for return traffic when 163 extras are scheduled.

Power Failure Stops Underground Trains.—A power failure caused by a technical fault at Brimsdown power station, Enfield, Middlesex, blacked out a large area of North London on December 14. Trains on the Northern Line, London Transport Executive, were stranded in the open between Golders Green and Edgware, and Finchley Central and Barnet, and passengers from four of them walked along the tracks to the nearest station. Five other Underground trains were standing at platforms when the power failed. Power was restored to most places after about half-an-hour, but between Finchley and Barnet trains were delayed for 70 min.

Sir Brian Robertson's Message to British Transport Staff.—Chairman of the British Transport Commission, Sir Brian Robertson, has issued the following Christmas and New Year message to members of the staff throughout the Commission's undertakings: "Christmas is here again. Great preparations are afoot in every home. Our trains, buses, and coaches are crowded. Our parcels and goods depots are humming; so are our ports. Our hotels are well booked. Just when most other people are looking forward to a 'stand-easy' and a good time, you have to work harder than ever. Moreover our weather is apt to be at its worst just now, making it all the harder to move the traffic. It is good to be busy. I am sure that you agree with that. After two rough years, Christmas this year holds out to us promise of busy times ahead, of progress in our great industry, and a hope of better times for those in it. So—a very happy Christmas to you and your families, and the best of fortune to you and to all of us in 1960."

New Warehouse at Melton Mowbray Goods Depot.—Work has begun on a warehouse at Melton Mowbray Goods Depot, British Railways, London Midland Region. It will replace the present obsolete warehouse and goods shed, and will be equipped with handling appliances for full palletisation. New accommodation for the staff also will be provided. The depot deals with large quantities of fertilisers and food for cattle and other animals.

R. A. Lister & Co. Ltd. Record Earnings.—The final dividend of 9 per cent declared by R. A. Lister & Co. Ltd. for the year to September 30, makes a total of 14 per cent compared with 12½ per cent the previous year. Group profits before tax have risen by nearly £110,000 to a peak of £1,183,189. Net earnings are £99,797 higher at £587,309.

Vote Against Christmas Eve Railway Strike.—A demand for a 24-hr. railway strike on Christmas Eve, on British Railways London suburban and L.T.E. Underground lines was reported to have been rejected last week by the executive committee of the London district council of the National Union of Railwaymen. It was decided to call a special delegate meeting on January 5 to consider future action in the light of existing conditions.

Christmas Holiday Trains in the Southern Region.—The Southern Region of British Railways is running 200 extra main-line trains between London and the South Coast and the West of England during the Christmas holidays. Yesterday 73 extra trains left London and 19 arrived at main-line termini. On December 27, there will be 81 extras. Services are being withdrawn today and tomorrow on little-used branch lines, but special Boxing Day main-line services are being operated. Extra trains and cheap fare facilities are being made available for sporting events.

Heenan Group Limited Results.—Mr. Charles L. Hill, Chairman, Heenan Group Limited, stated at the general meeting held in Worcester recently that the downward trend in the order position continued during the first half of the year, but thereafter there was a marked recovery and the year ended with a balance of orders of £3,600,000 compared with last year's figure for the present group companies of £4,000,000. The group's cash and marketable investments increased considerably. Group net profit, before taxation, at £521,469, is the highest ever recorded and compares with £419,481 last year. The net profit of the group is £158,880, which compares with £169,314 in 1958. A total distribution of 15 per cent (10 per cent) has been approved.

I.C.I. Plans Extension to Solvents Capacity.—Imperial Chemical Industries Limited is to build an extension to its trichloroethylene and perchloroethylene plants at Castner-Kellner Works, Runcorn, at a cost of £1,000,000. Technical service and development work on the uses of these two solvents has been carried out by I.C.I. over many years. This has led to a growing demand for both products, more particularly in the engineering industry for metal de-greasing and for dry-cleaning. The extension now planned will increase the company's combined capacity for these two solvents by 25 per cent, and will enable I.C.I. to satisfy the demands of the home market for several years and permit a further increase in its export trade. The extension will be based on a new manufacturing process expected to lead to lower production costs. It is to be completed in 1961.

Leeds-Pontefract Diesel Service Extended to Pontefract Baghill.—From January 4, 1960, certain of the British Railways, North Eastern Region, diesel trains now running between Leeds Central and Pontefract Monkhill will be extended to run to and from Pontefract Baghill. From the same date new special cheap day single and return fares will be introduced between Pontefract Baghill and Leeds Central and intermediate stations.

Additional Tilbury-Gravesend Ferry Sailings During Christmas Period.—Since December 21 and until January 2, British Railways, Eastern Region, is operating a 20-min. service daily from 7.5 a.m. until 11.5 p.m. on the motorcar ferry between Tilbury and Gravesend.

South London Line Stations Closed During Christmas Holiday.—Wandsworth Road, Clapham, and East Brixton Stations on the South London Line of British Railways, Southern Region, are closed today (December 25) and tomorrow. The other stations on the line, Denmark Hill, Peckham Rye, Queens Road, Peckham, and South Bermondsey, are served by electric trains on other Southern Region routes.

Ransome & Marles Bearing Co. Ltd.—Mr. E. W. Senior, Chairman, Ransome & Marles Bearing Co. Ltd., stated at the recent general meeting of the company in Newark, Nottinghamshire, that the reduced demand for bearings experienced at the end of 1958 continued well into 1959, influenced no doubt by the liquidation of stocks by customers, and it was only in the last three months of the financial year that sales began to increase. Consequently, as compared with last year, there was a drop in the consolidated net trading surplus from £1,423,755 to £1,182,056. The net profit of the group is £609,396 as compared with £666,581. The Directors have recommended a final distribution of 10 per cent and a bonus of 2½ per cent. An interim dividend of 5 per cent was paid in March.

Associated Commercial Vehicles Limited Results.—The net profit of Associated Commercial Vehicles Limited for the year ended September 30, 1959, amounted to £538,238 (£163,003) after crediting £19,281 (nil) in respect of non-trading items. The profit for the year reflects benefits arising from the rationalisation and re-organisation programme and the abolition of purchase tax on commercial vehicles which has also had a beneficial effect on the order position. Output at the factories is at an encouraging level and there is every indication that this will be maintained during the coming year. The directors propose a final dividend of 12½ per cent less income tax which with interim dividend of 5 per cent will make a total for the year 17½ per cent absorbing £223,754. This excludes the special interim dividend of 5 per cent paid on February 13, 1959. The dividend on the 5½ per cent redeemable preference shares amounts to £48,984 (£47,438).

Coventry Gauge & Tool Co. Ltd. Results.—Group net profit for the year to August 31 by Coventry Gauge & Tool Co. Ltd. is £181,250, which includes £120,019 in respect of the Rockwell Engineers Group for the period from acquisition in October, 1958.

The group net profit for the previous year, which did not include that of the new acquisition, was £160,041. The final dividend is 5½d. tax free a 10s. ordinary stock unit making 7½d. tax free a unit (unchanged) but payable on the increased capital.

Silentbloc Limited Results.—At the annual general meeting of Silentbloc Limited, held in London last week, Mr. D. H. Dulanty, Chairman, stated that during the past year, greatly increased competition reduced profit margins in the old established products of the group. The satisfactory result of the year's trading was largely due to products which had been introduced during recent years. During the past financial year the group's trading profit increased from £405,583 to £419,009 and the profit before tax from £297,237 to £306,437. The net profit for the year amounted to £149,799. Dividends paid and recommended for the year total £82,500 gross, and after deduction of tax to £48,984.

Harrow & Wembley Productivity Association Conference on Transport.—Reference was made on page 471 of our November 20 issue to the conference, with the theme "Can you afford your transport fleet?" to be held on January 5 in the Council Chamber of the Federation of British Industries at 21, Tothill Street, S.W.1. The organisers are the Harrow & Wembley Productivity Association in conjunction with the British Productivity Council. The conference is concerned specially with the application of work study to transport problems. Mr. E. W. Hancock, a Director of Humber Limited and Chairman of the Coventry Productivity Association, will take the chair. Speakers will be Mr. Hancock, on "The Transport Industry"; Messrs. J. H. Francis and S. J. Squires, members of the British Productivity Council Work Study Team, on "A Logical Approach: Work Study"; Mr. D. Bowick, District Operating Superintendent, British Railways, Eastern Region, Lincoln, on "Problems Affecting the Larger Fleet Operator"; Mr. J. F. Elkington, Director of Sopers of Harrow Limited, on "Problems Affecting the Smaller Fleet Operator"; Mr. J. H. Francis, on "A Pilot Study"; Mr. F. Eastwood, National Secretary of the Transport & General Workers Union, on "Human Problems and the Joint Approach." A panel of the Chairman and speakers will act as a brains trust. The Chairman will then sum up. Further details and tickets, price £2 2s., may be obtained from Mr. A. G. Sells, Hon. Secretary, Harrow & Wembley Productivity Association, Industrial Engineering Department, Kodak Limited, Headstone Drive, Wealdstone, Middlesex.

Railway Stock Market

Optimism as to 1960 has dominated stock markets, which are ending the year firmly with many leading industrial shares at or near their highest levels touched in the past 12 months. Many shares are at the highest levels they have ever reached. This is widely regarded as justified, because it is assumed that higher dividends are in prospect, and that the next Budget will bring further tax reductions. But competition in both home and export markets is likely to be keener than ever, and in the new year there may very well be a tendency for profit margins to narrow, particularly as there is likely to be response to the request by the Chancellor of the Exchequer to industry to pass on benefits of increased efficiency by reducing prices, so as to help export trade.

In contrast with the trend in industrial shares foreign rails are closing the year quietly with no particular feature. Antofagasta ordinary stock is now 16, which compares with extremes of 20½ and 11½ in the year. The current price of 28½ for the preference stock compares with highest and lowest in the year of 34½ and 21½ respectively.

Costa Rica Railway ordinary stock has had extremes in the year of 23 and 12; the current price is 21½. United of Havana consolidated stock was up to 6½ earlier in the year; it is now 6. Extremes of Mexican Central "A" bearer debentures have been 60½ and 49½; the current price is 55½. The year's extreme for International Railways of Central America common shares were $26 and $19; the current price is $22½. Paraguay Central prior debentures are now 18½ compared with the year's high and low of 24 and 10¾. High and lows for Brazil Railway bonds have been 7½ and 5; current price is 7.

Nyasaland Railways shares, which are now 11s., have had extremes in 1959 of 15s. 9d. and 9s. 9d. Midland of Western Australia second income debentures have had extremes of 13½ and 9, which compare with the current price of 13½.

Canadian Pacifics, which are now $47½, have been up to $57½ and down to $45½ in 1959. The current level of White Pass shares is $13⅜ and the year's extremes $15⅝ and $13.

Engineering and kindred shares are attracting rather more attention on hopeful views about the outlook, because, it is argued, the engineering industry generally will have to become increasingly active if prosperity is to continue.

As to shares of locomotive builders and engineers, it is recognised that in the main they have to be regarded as long-term holdings, and that there is little prospect of any early improvement in dividends. Nevertheless yields at current prices are quite satisfactory, and as long term holdings these shares have their merits as regards prospects of capital appreciation and higher dividends as time progresses.

Beyer Peacock 5s. shares are currently 8s. 6d., which compares with extremes in the year of 9s. 1½d. and 7s. 3d. The year's extremes for Wagon Repairs have been 11s. 9d. and 7s. 9d., and these 5s. shares are now 11s. 4½d. Gloucester Wagon 10s. shares, now 15s., have had extremes for the year of 19s. and 13s. G. D. Peter's extremes were 28s. and 17s., and the current price 20s. 7½d. North British Locomotive are now 9s. compared with a high and low in the year of 14s. 4½d. and 7s. 6d. Extremes for Westinghouse Brake have been 53s. 9d. and 39s. 9d., and the current price 50s. 6d. During the year Associated Electrical have been up 67s. and down to 54s.; current price is 60s. Year's extremes for General Electric were 48s. 9d. and 30s.; the shares are now 43s. 3d. English Electric are now 46s., which compares with a high and low in the year of 51s. and 38s. respectively.

Forthcoming Meetings

January 5 (Tue.).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, Cardiff Branch, at the Angel Hotel, Cardiff, at 6.30 p.m. Address by Sir Leslie Ford, General Manager, Port of London Authority, on "The Port of London revisited," illustrated.

January 5 (*Tue.*).—Railway Correspondence & Travel Society, West Midlands Branch, at 64, Holyhead Road, Coventry, at 7.30 p.m. Paper on "Red earth and green engines" (Midlands ironstone mine railways), by Mr. E. S. Tonks.

January 6 (*Wed.*).—Railway Students' Association, at the London School of Economics & Political Science, Houghton St., Aldwych, W.C.2. New Year dinner and dance.

January 6 (*Wed.*).—Institution of Railway Signal Engineers, London Section, at the Institution of Electrical Engineers, Savoy Place, W.C.2, at 6 p.m. Paper on "The electrical properties of concrete sleepers," by Mr. E. Morgan, British Railways Research Centre.

January 7 (*Thu.*).—Institution of Electrical Engineers, at Savoy Place, London, W.C.2, at 5.30 p.m. Second Hunter Memorial Lecture, "The protection of electrical systems," by Mr. H. G. Bell.

January 7 (*Thu.*).—Railway Correspondence & Travel Society, Bristol & District Branch at the Grosvenor Hotel, Bristol, 1, at 7.15 p.m. Paper on "Operating and signalling in the Bristol District," by Inspector R. Wellman.

January 8 (*Fri.*).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, E.C.4, at 7 p.m. Paper on "The Hay Railway 1810-60," by Mr. C. R. Clinker.

January 9 (*Sat.*).—Railway Correspondence & Travel Society, Sussex & Kent Branch, at the Regent Restaurant, Brighton, at 6.30 for 7 p.m. Annual dinner.

January 11 (*Mon.*).—Permanent Way Institution, London Section, at the Headquarters of the British Transport Commission, 222, Marylebone Road, N.W.1, at 6.30 p.m. Discussion "Keeping tracks to line and level," by Associate Members.

January 11 (*Mon.*).—Institute of Transport, London Section, at the Jarvis Hall (R.I.B.A.), 66, Portland Place, W.1, at 5.45 p.m. Paper on "The problem of the peak:" "Rail," by Mr. P. A. White, Line Traffic Manager, South Eastern Division, British Railways, Southern Region. "Road," by Mr. A. F. Neal, General Manager, Manchester Corporation Transport.

January 12 (*Tue.*).—Permanent Way Institution, York Section, in the Railway Institute, York, at 6.45 p.m. Paper on "Leeds City Station Modernisation," by Mr. W. E. Waite, District Operating Superintendent, Leeds City, Mr. H. C. Steeples, Assistant Engineer, New Works, Chief Civil Engineers' Office, York.

January 12 (*Tue.*).—Railway Correspondence & Travel Society, at the N.C.G. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Paper on "Recent developments on the R.H. & D.R.," by Mr. G. Barlow.

January 13 (*Wed.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Toft Green, York, at 5.30 p.m. Paper on "Modern trends in the design of signalling apparatus," by Mr. E. J. Harris, Westinghouse Brake & Signal Co. Ltd.

January 13 (*Wed.*).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas Street, S.E.1, at 6 p.m. Paper on "Transport treasures," illustrated, by Mr. J. Scholes, Curator of Historical Relics, British Transport Commission.

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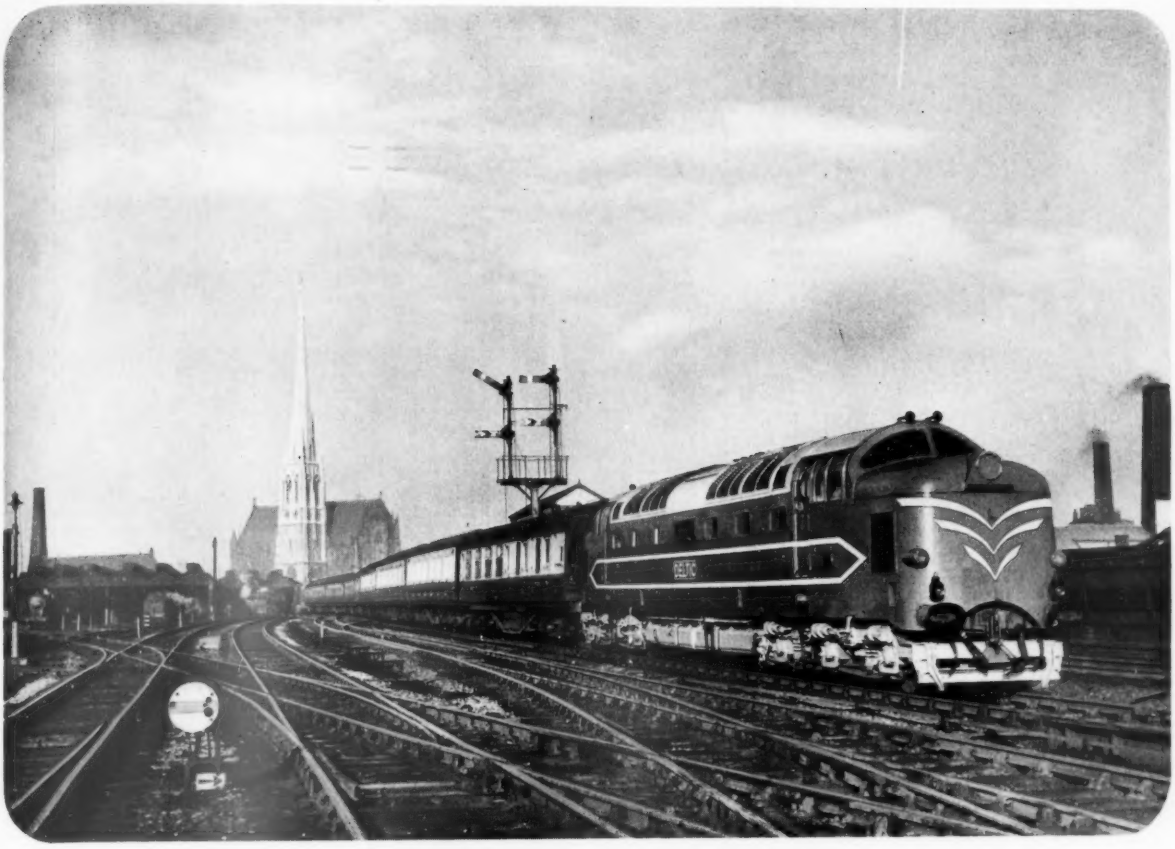

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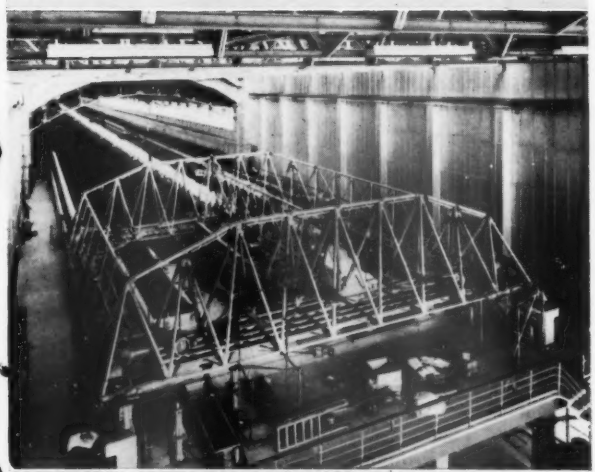

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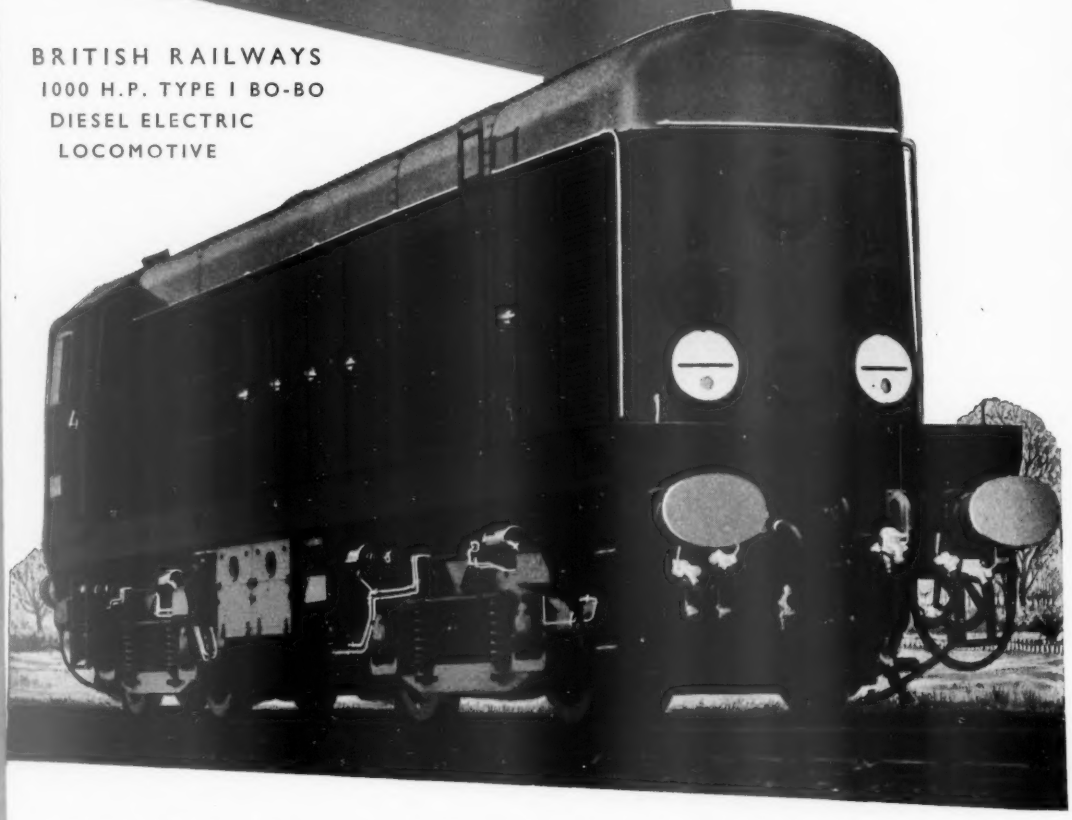

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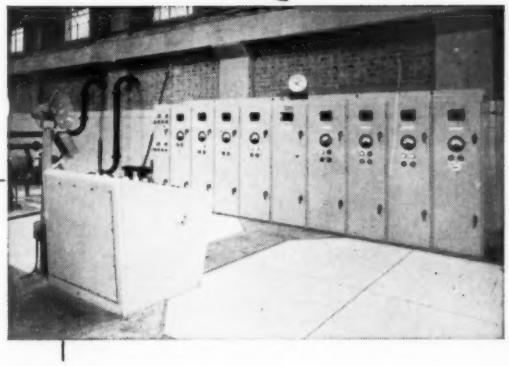

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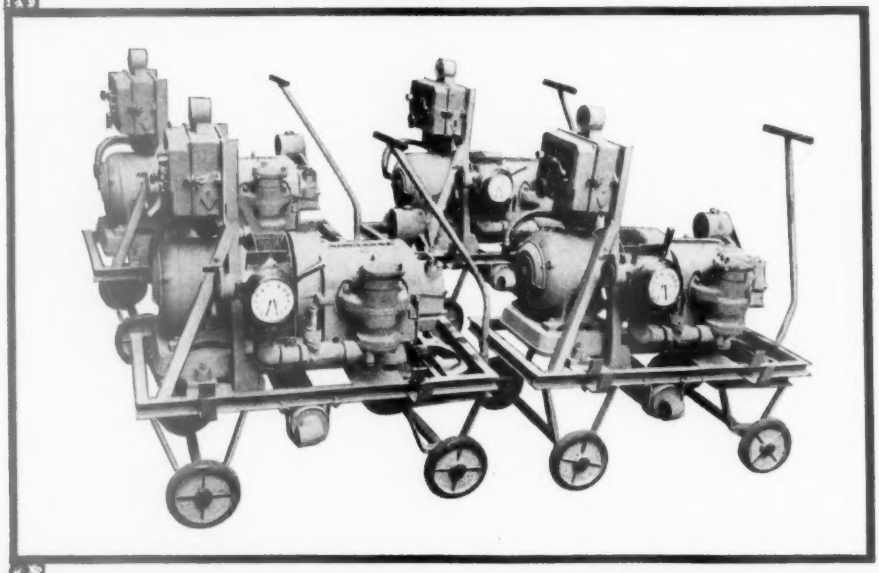

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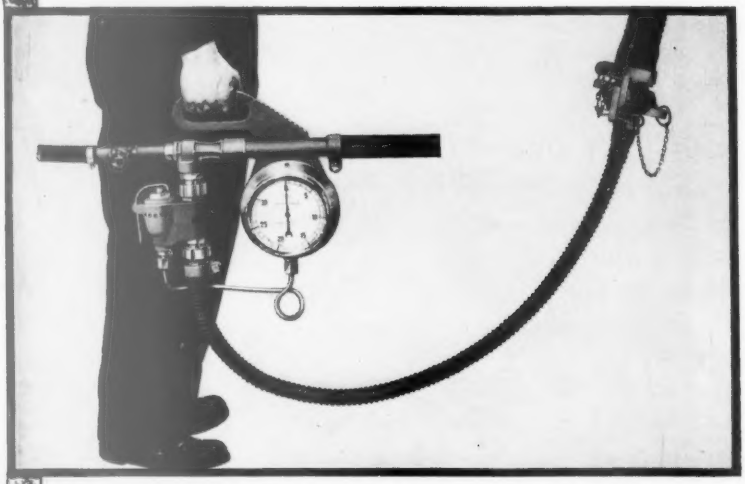

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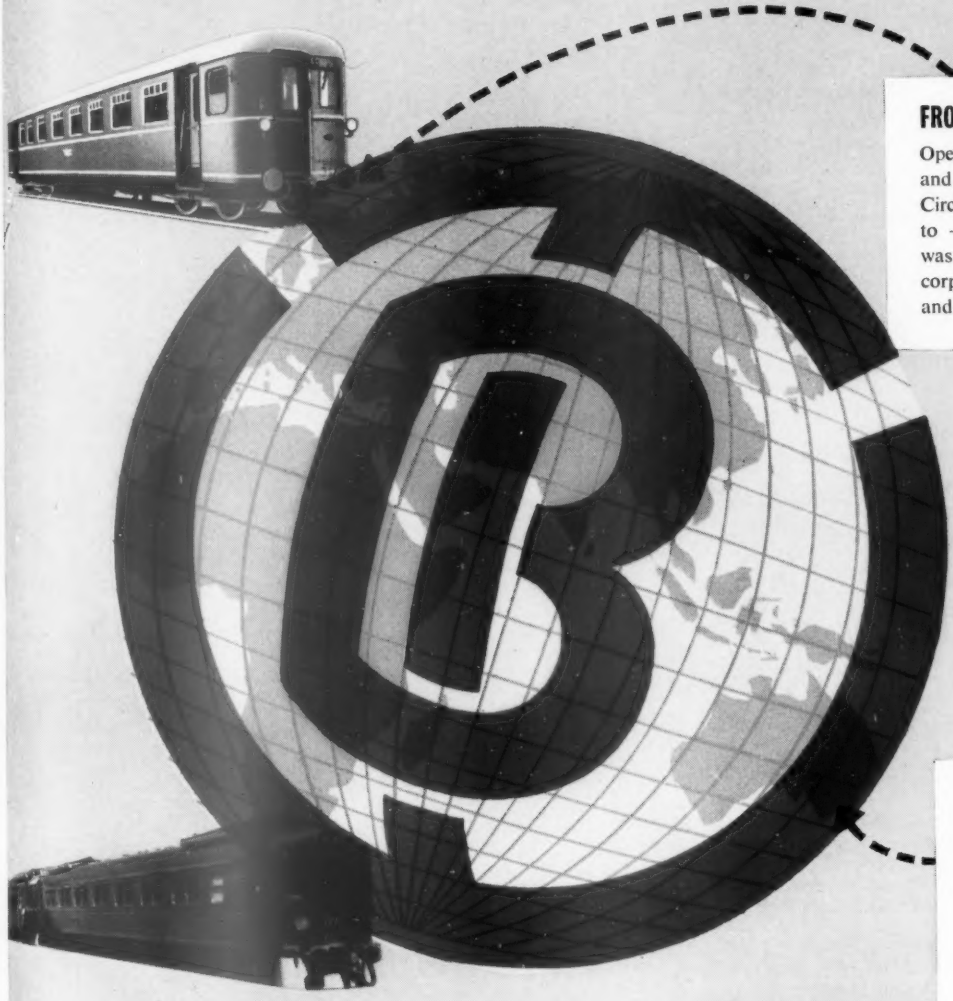

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The Piccadilly Line will have 760 G.E.C. traction motors with a continuous rating of 80.5 h.p. at 66% field. They will be generally similar to the 32 machines already supplied by G.E.C. for the three prototype tube trains now running on the Piccadilly Line.

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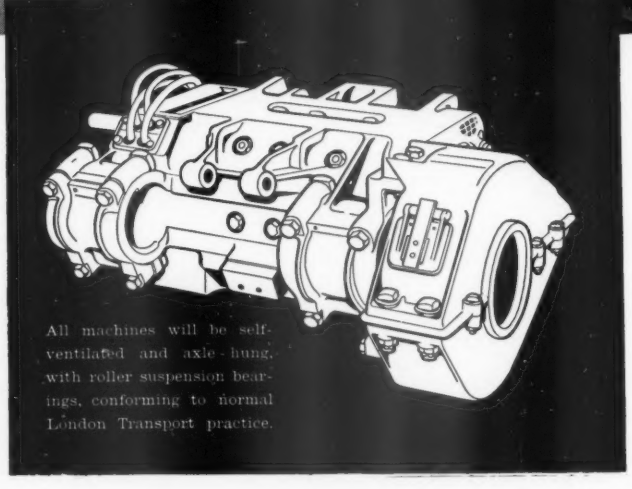

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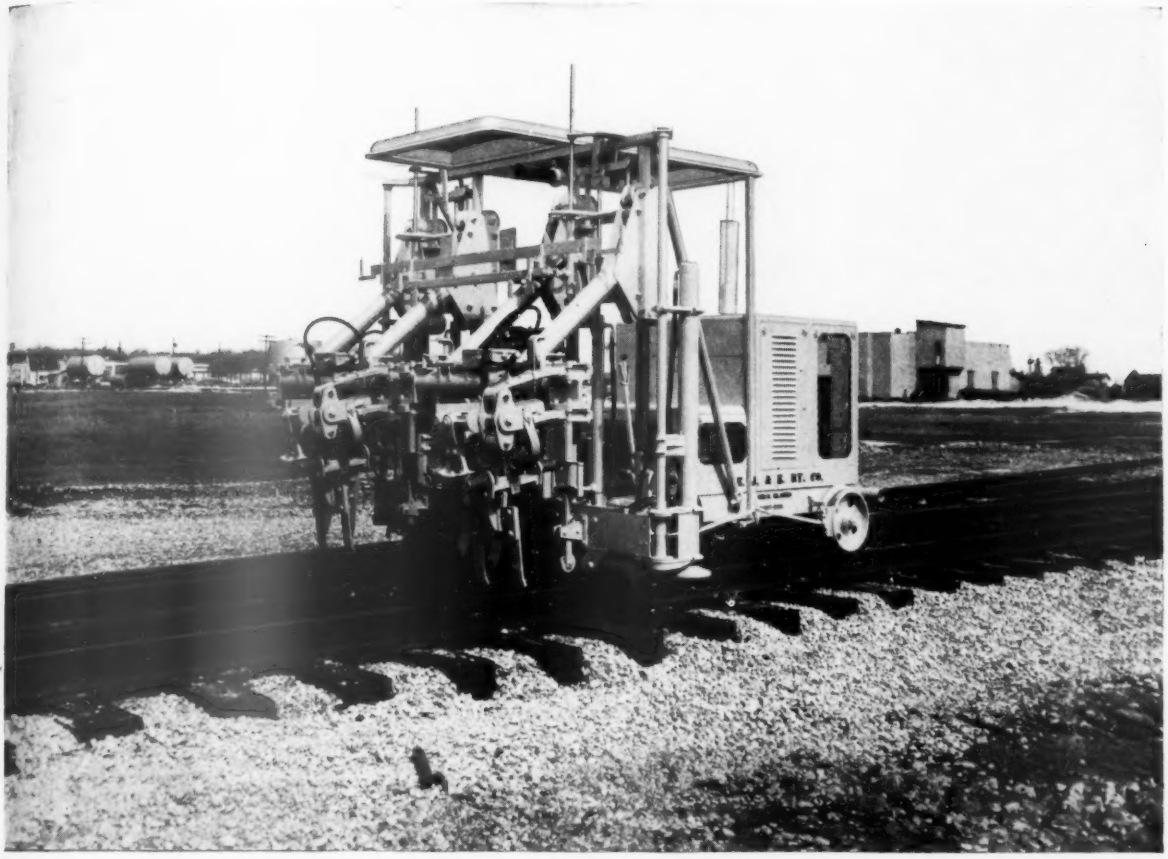

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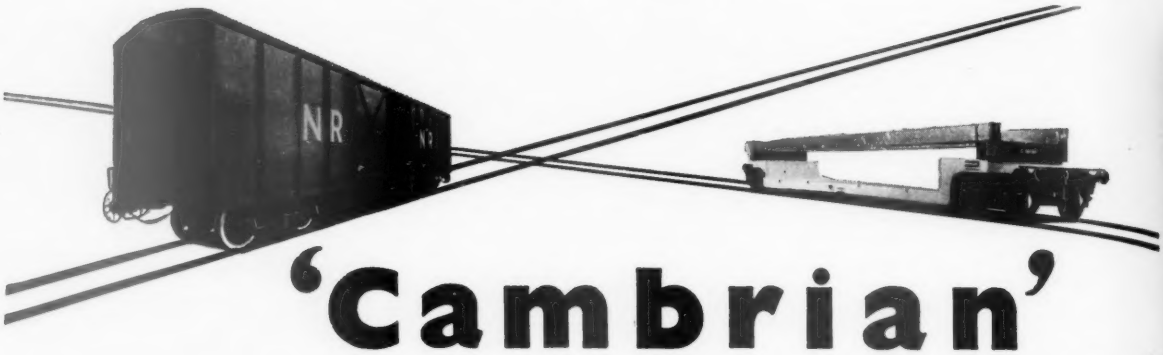

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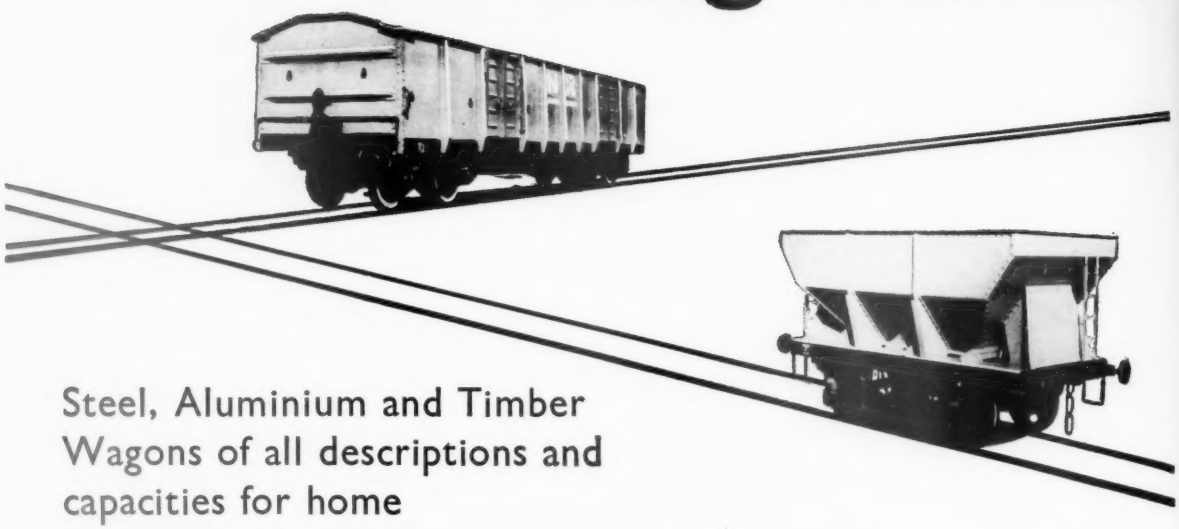

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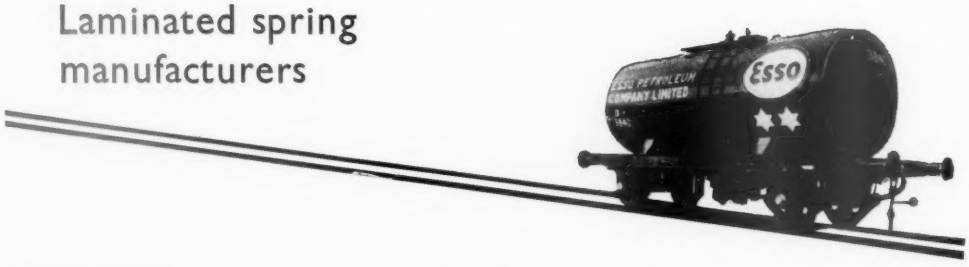

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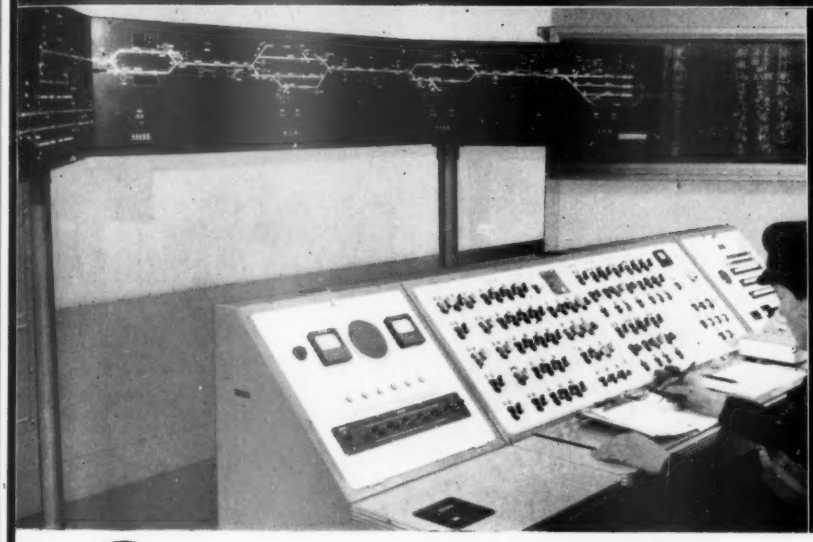

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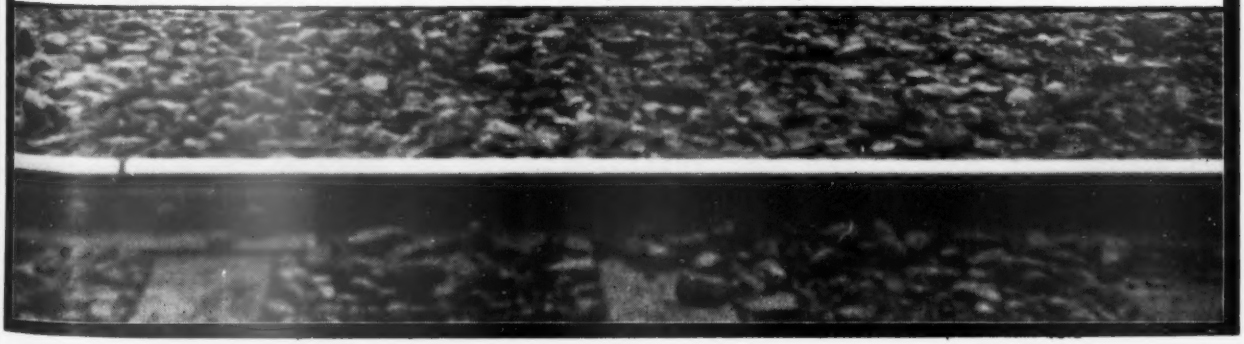

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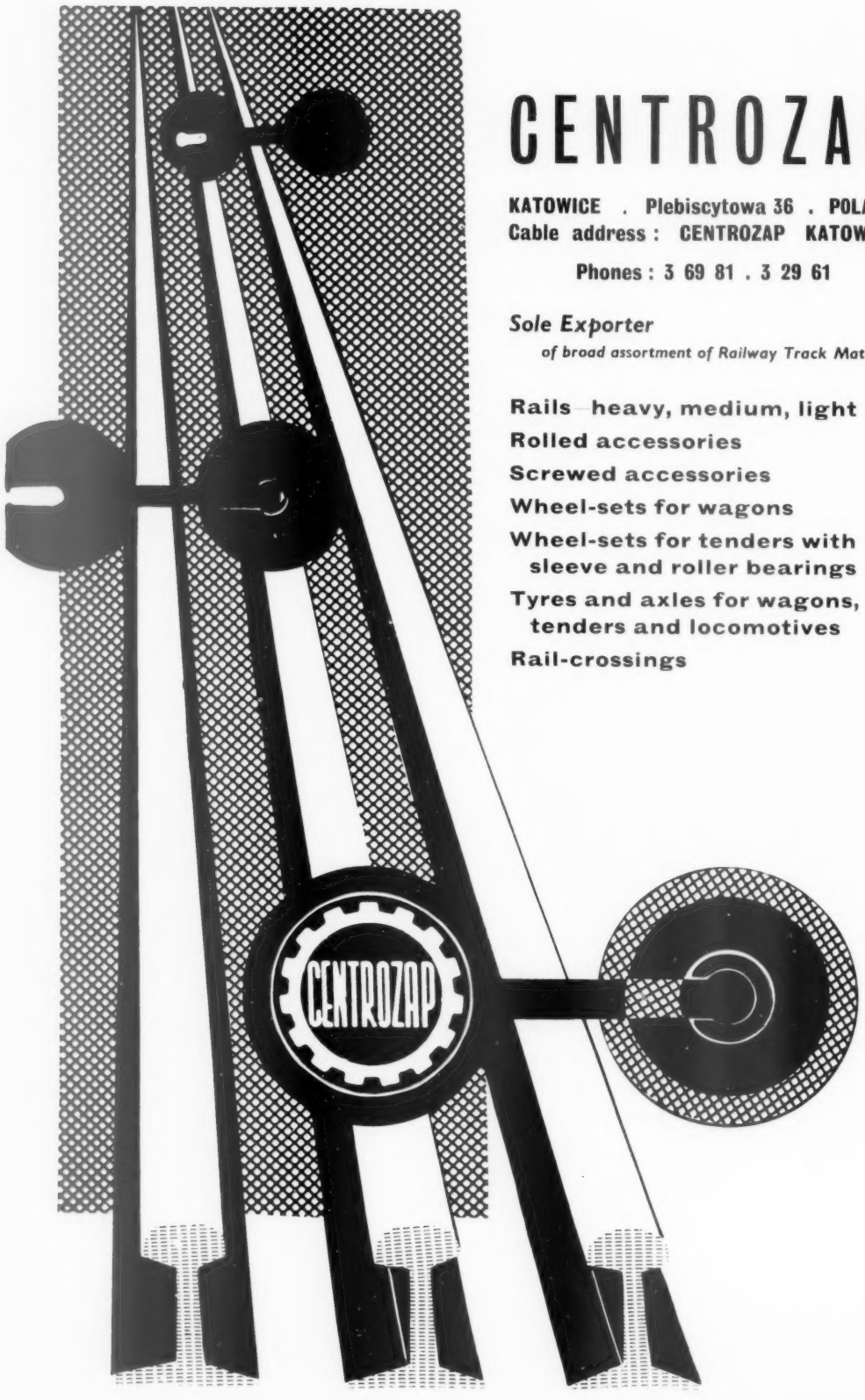

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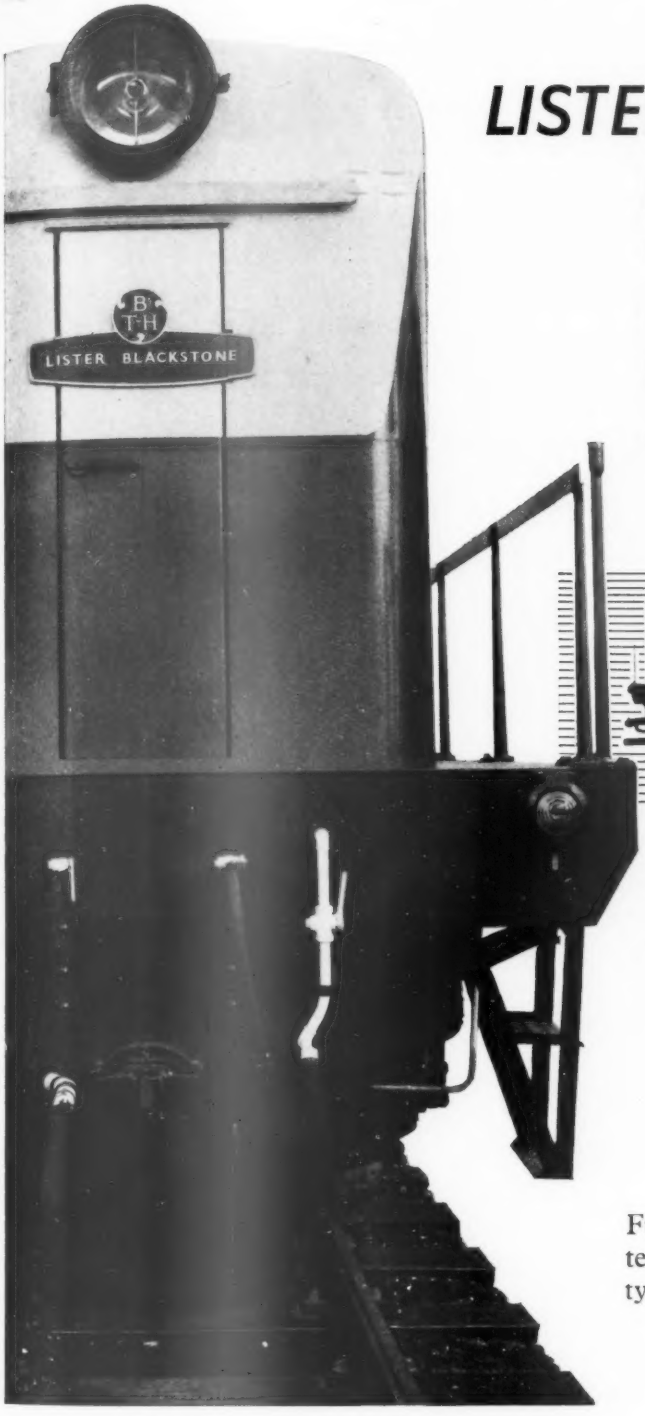

LISTER BLACKSTONE LOCOMOTIVE

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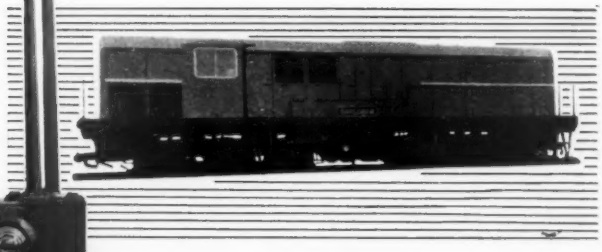

This engine has been type tested to B.S. 2953 at traction ratings of 1100 b.h.p. and drives through BTH electric transmission.

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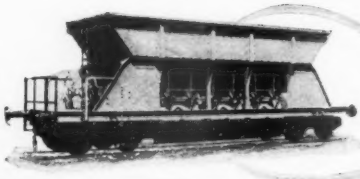

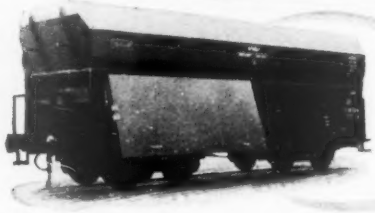

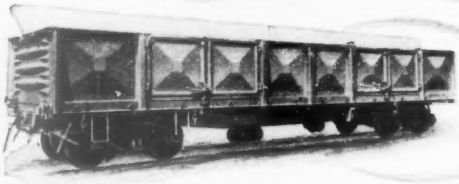

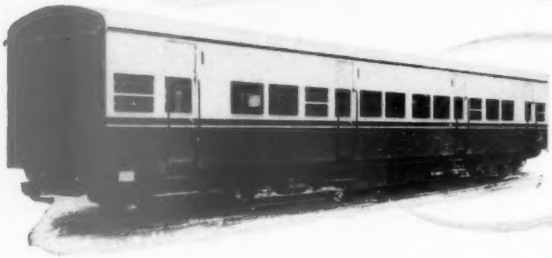

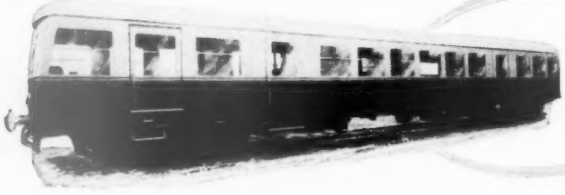

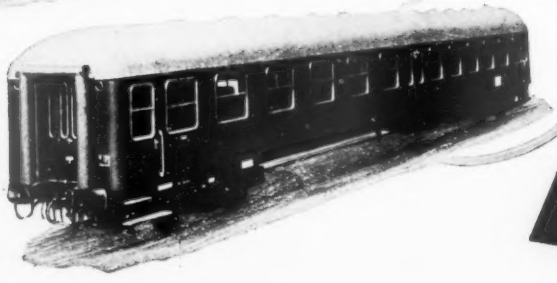

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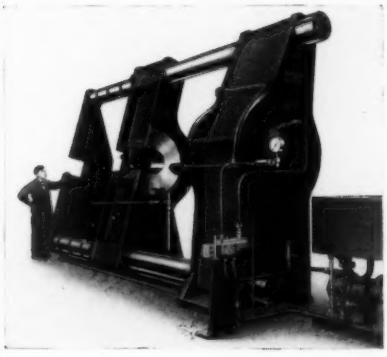

Here is a press designed for high tonnage assembling, particularly the operation of forcing shafts or axles on to or out of wheels. The illustration which is representative of a large range, is of a 400 tons capacity "inclined type" wheel press, the tie bars being off-set from the vertical centre line, to facilitate loading.

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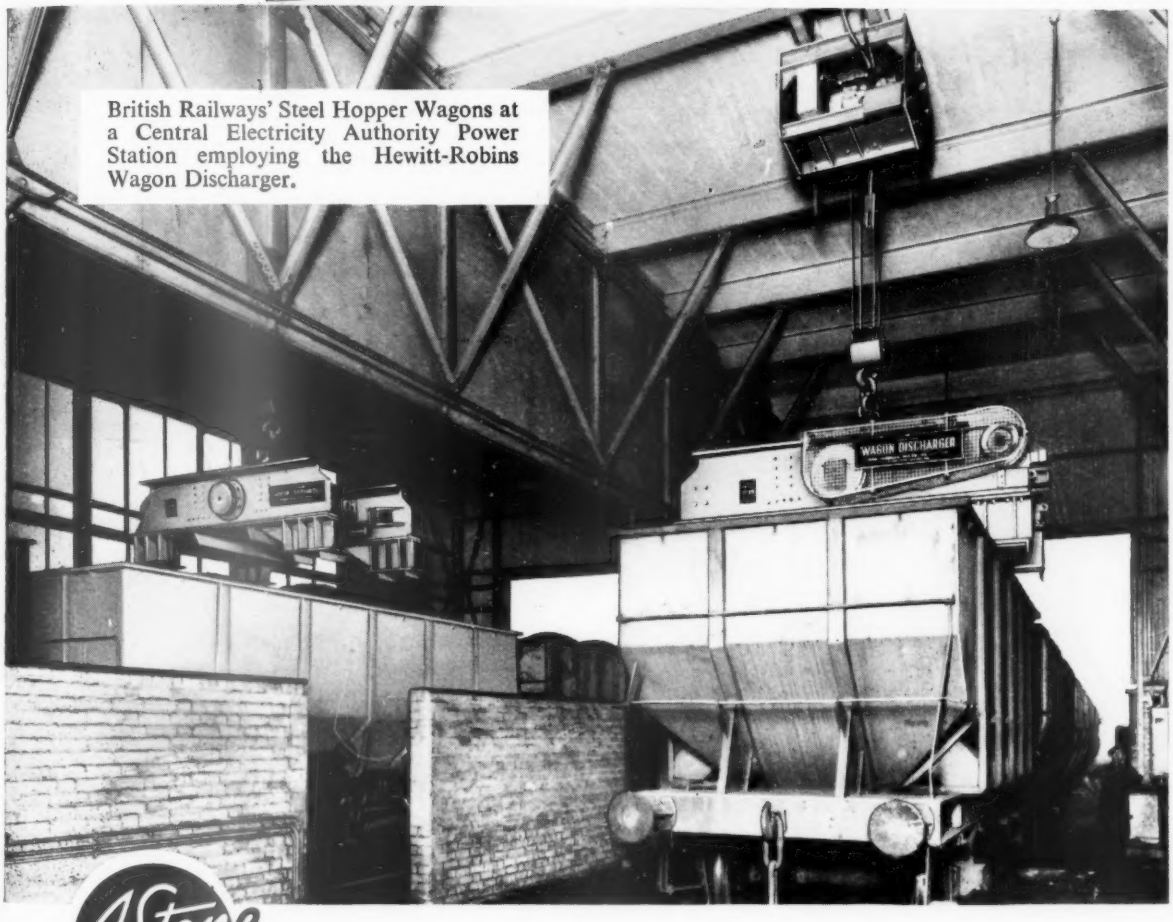

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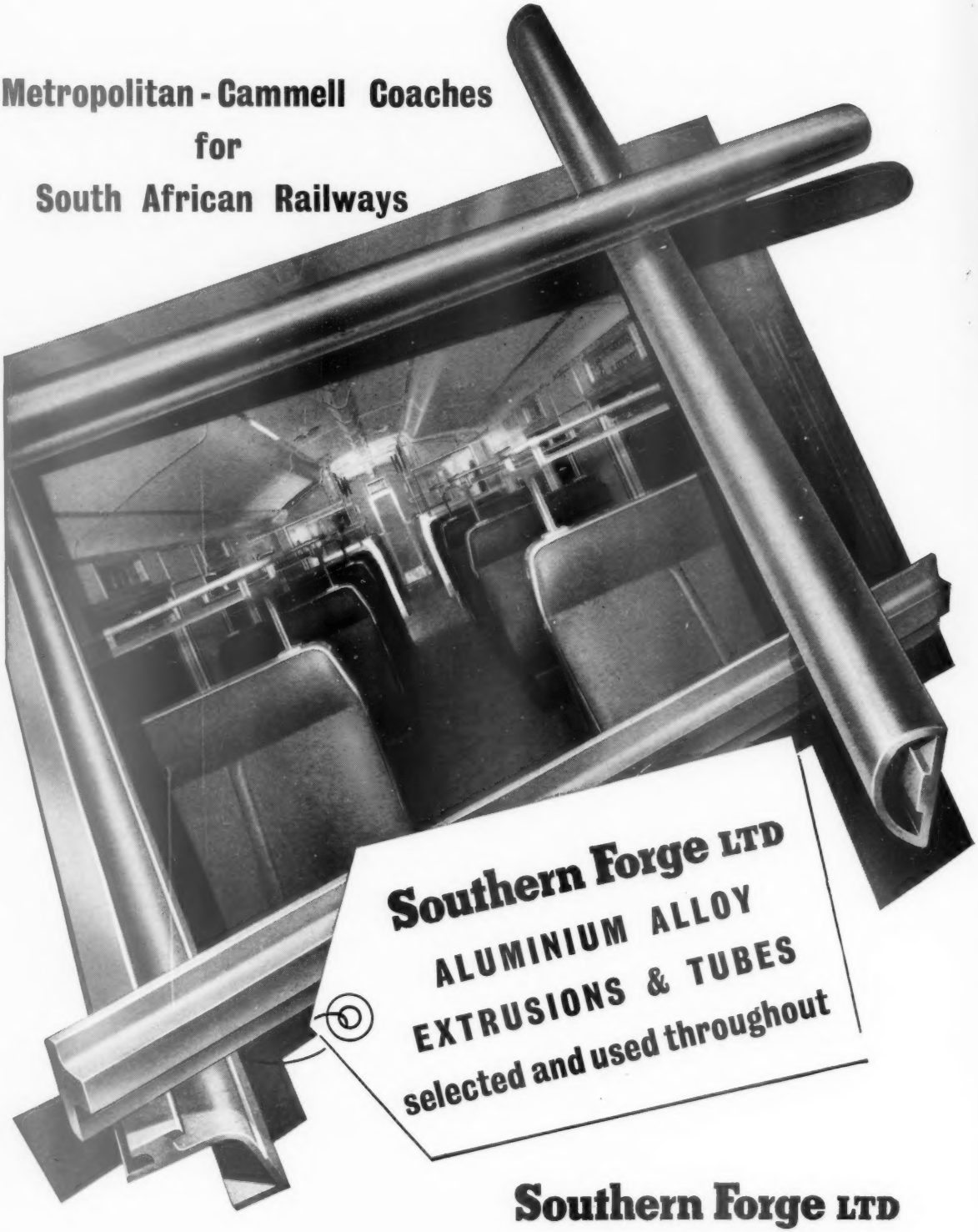

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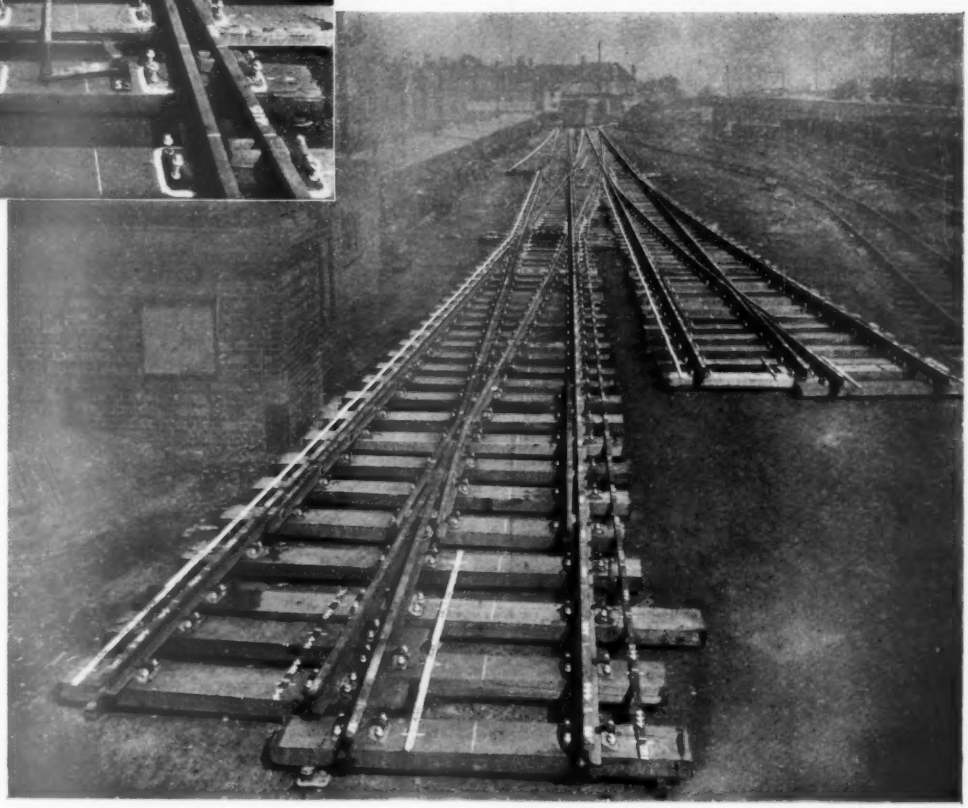

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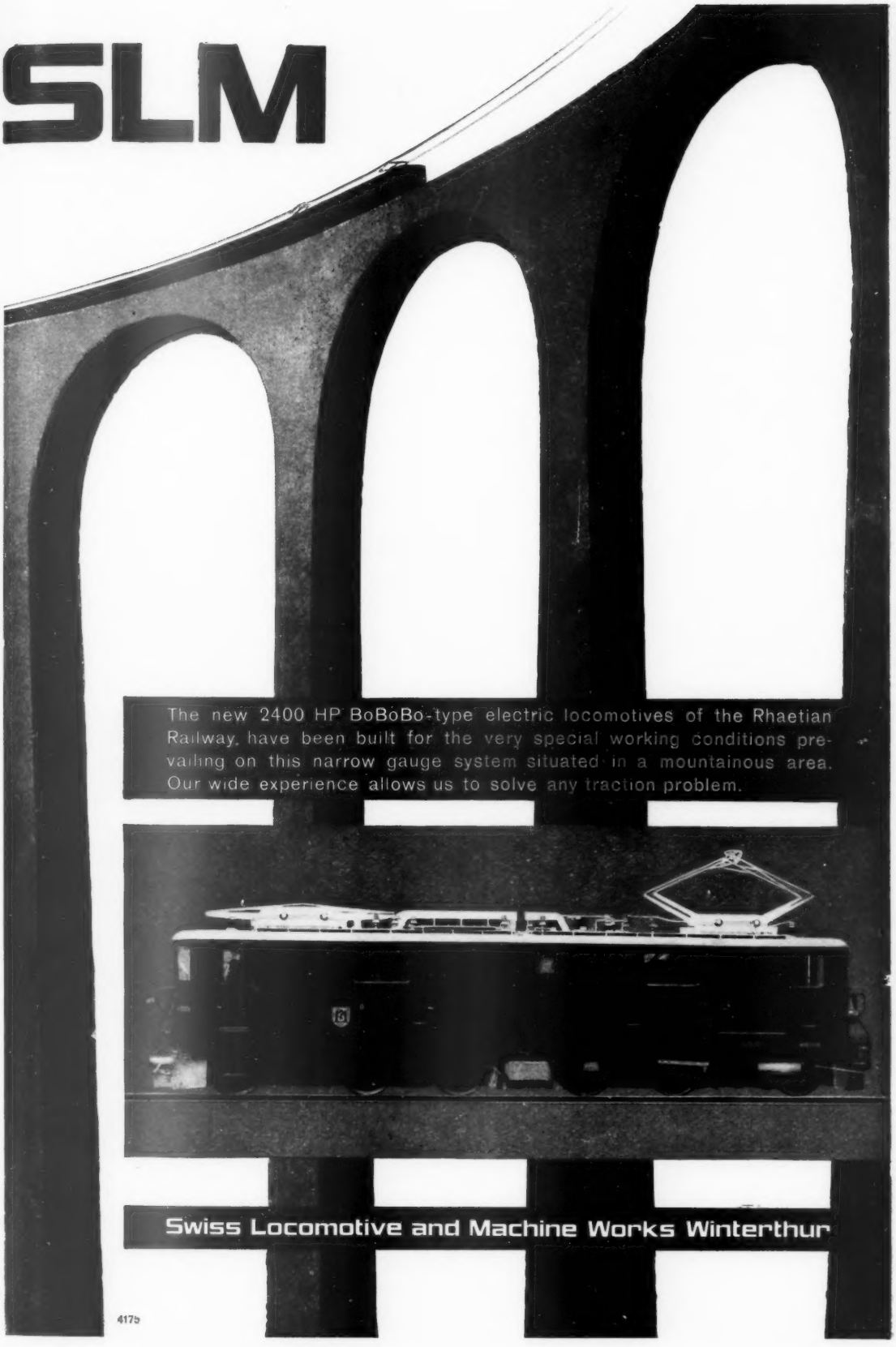

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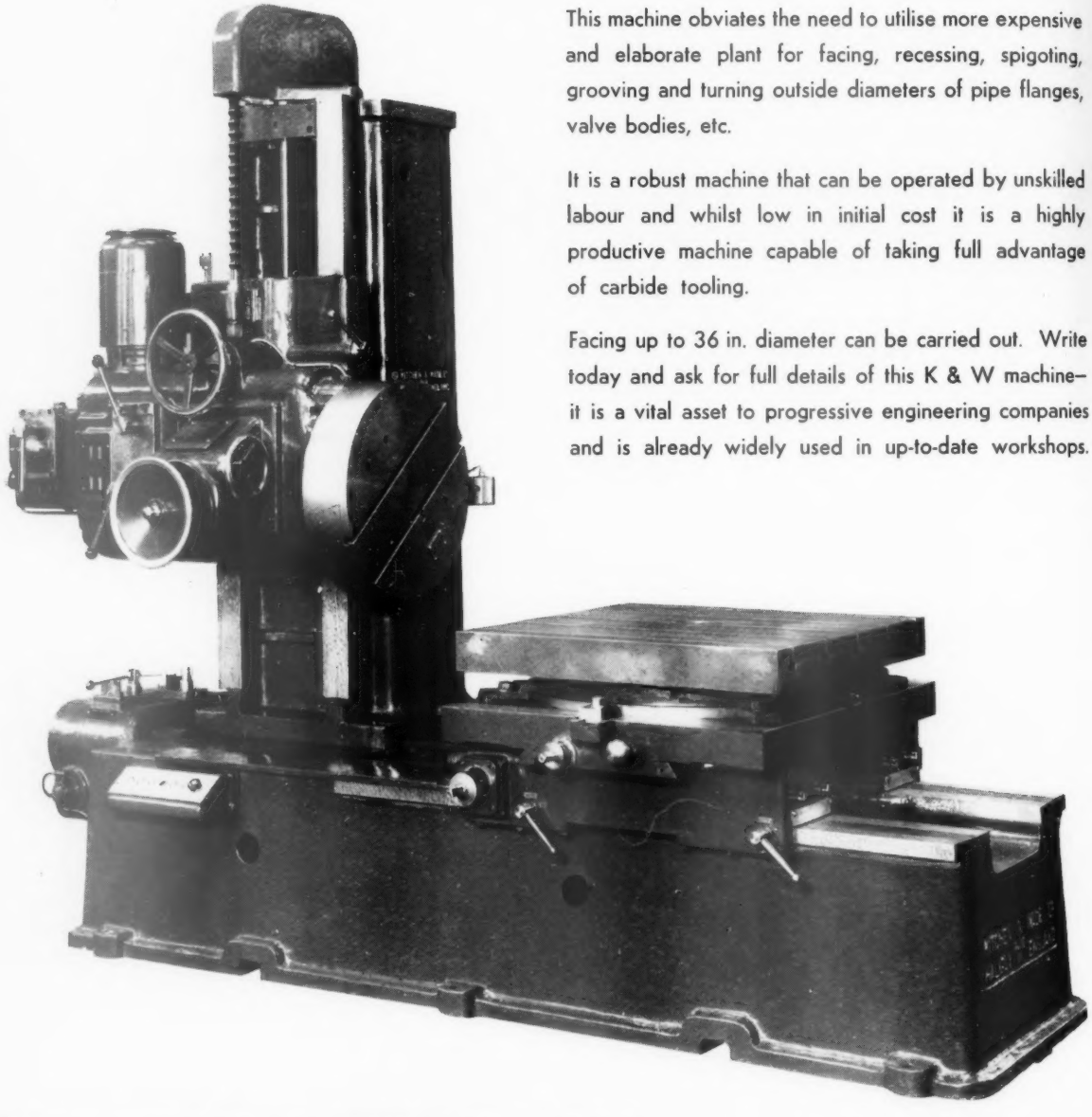

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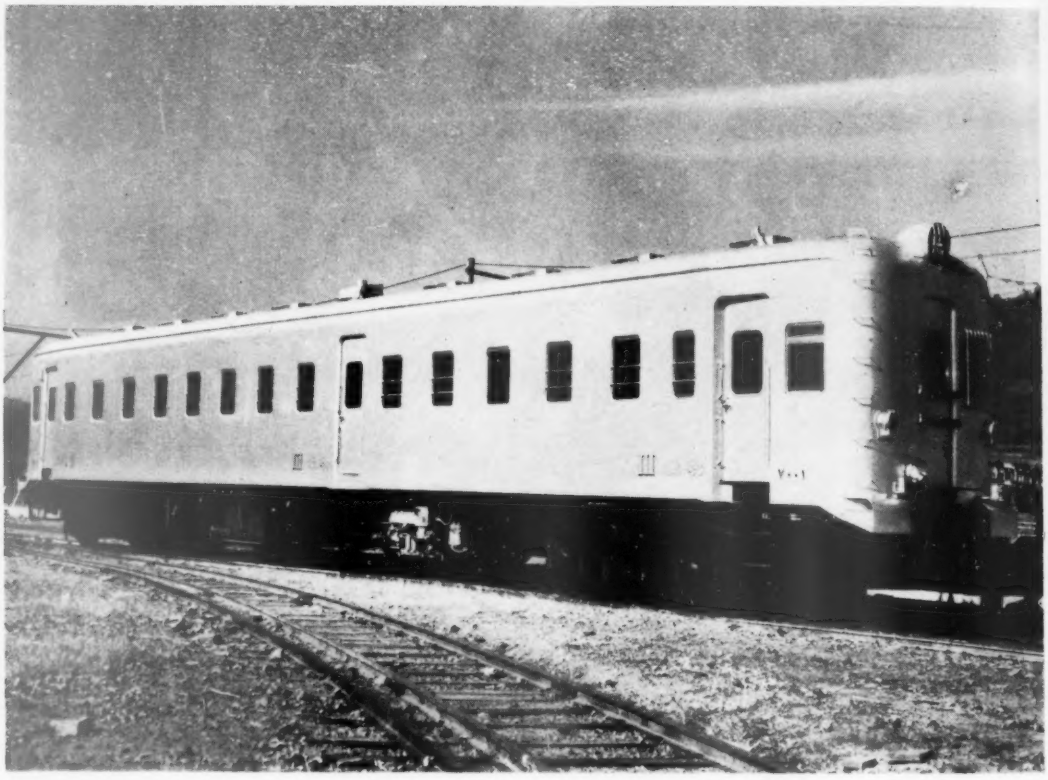

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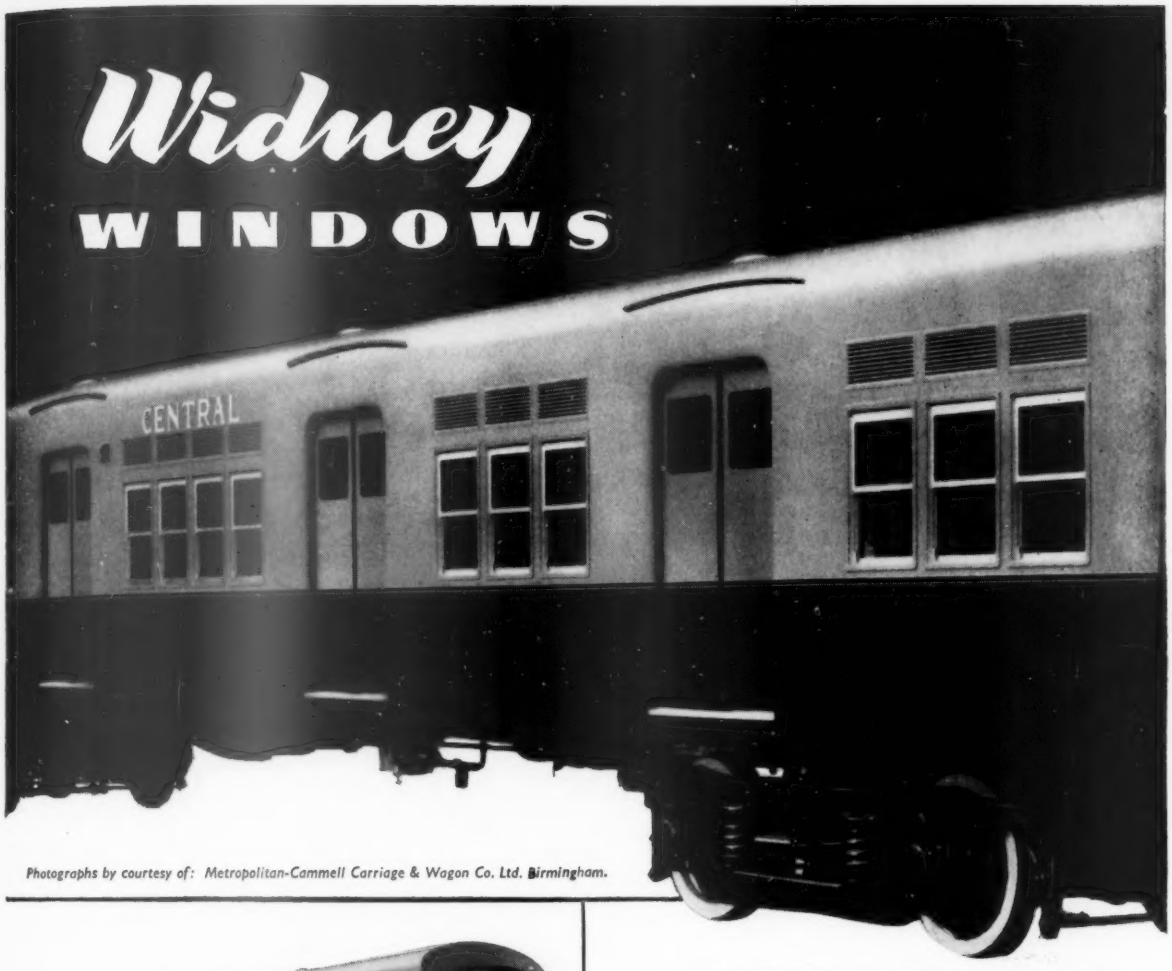

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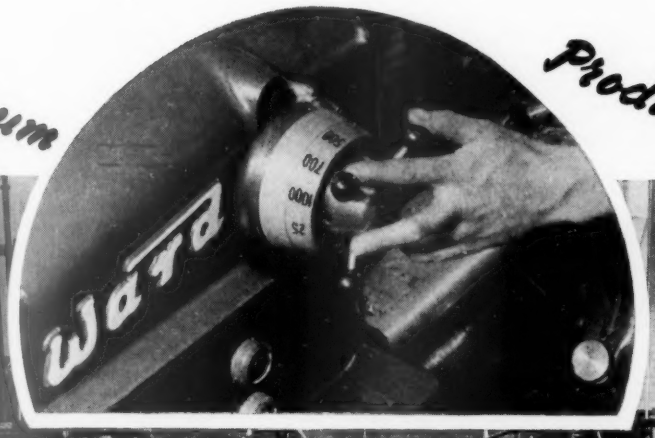

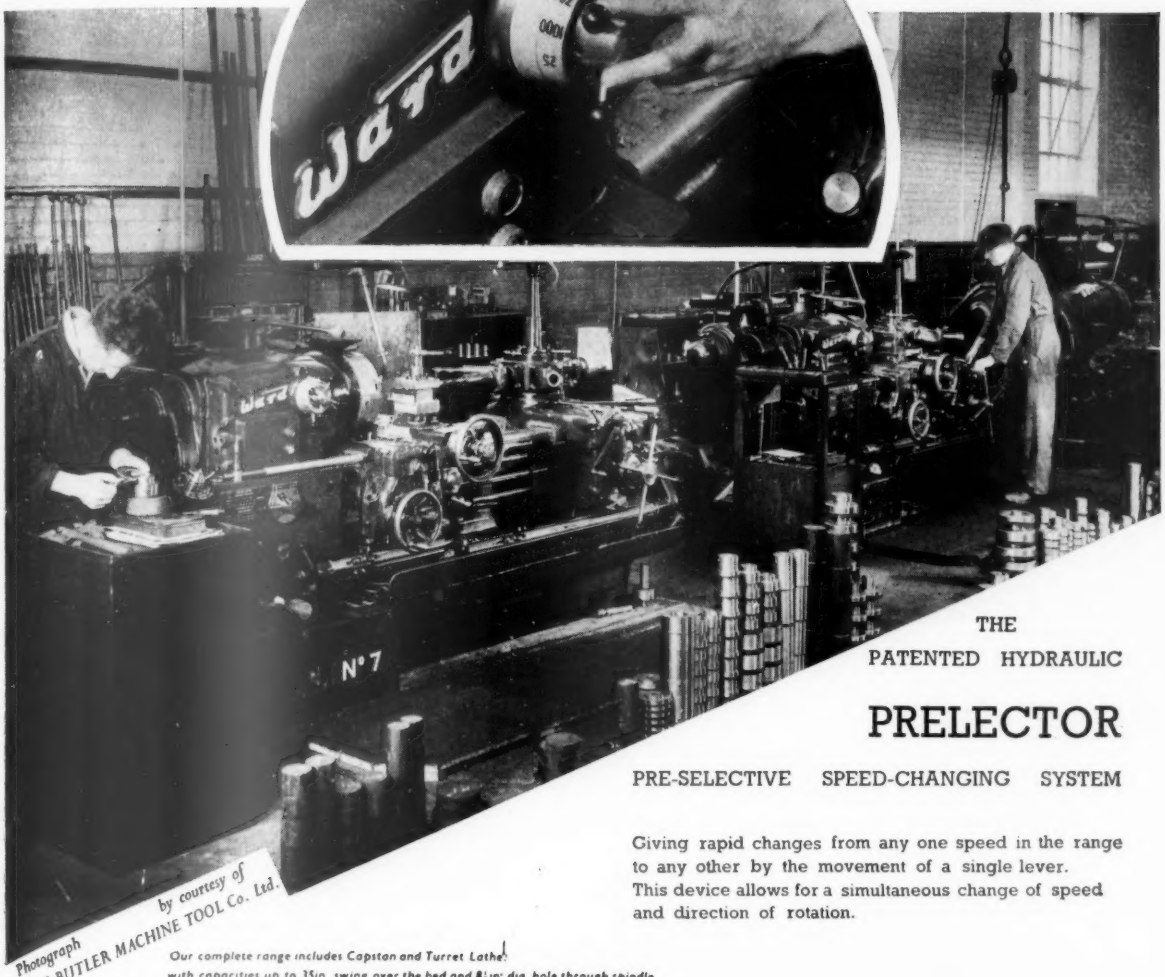

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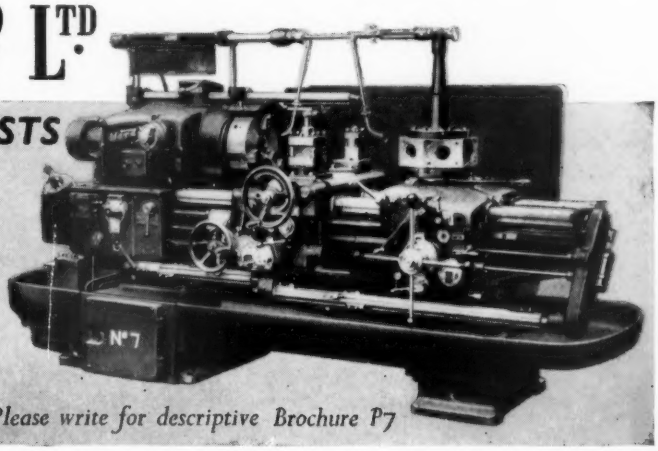

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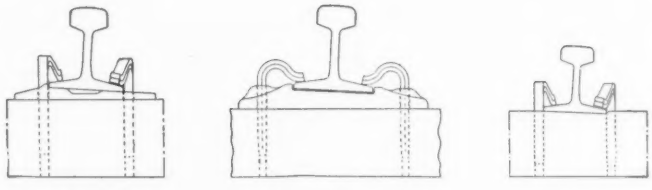

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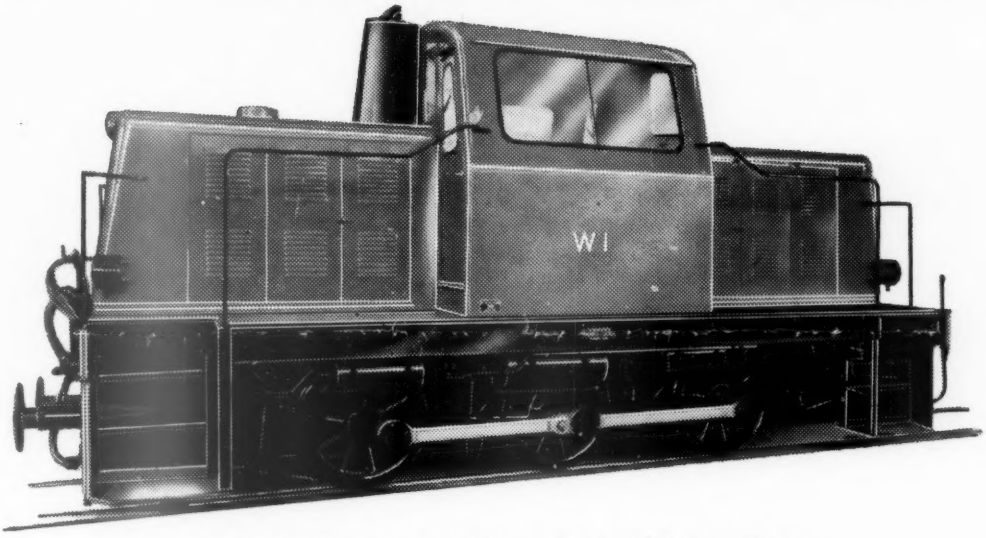

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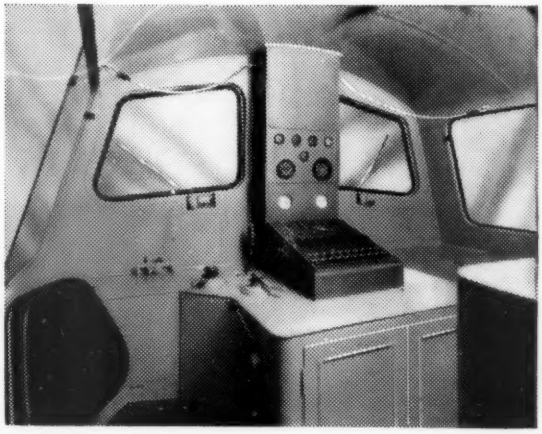

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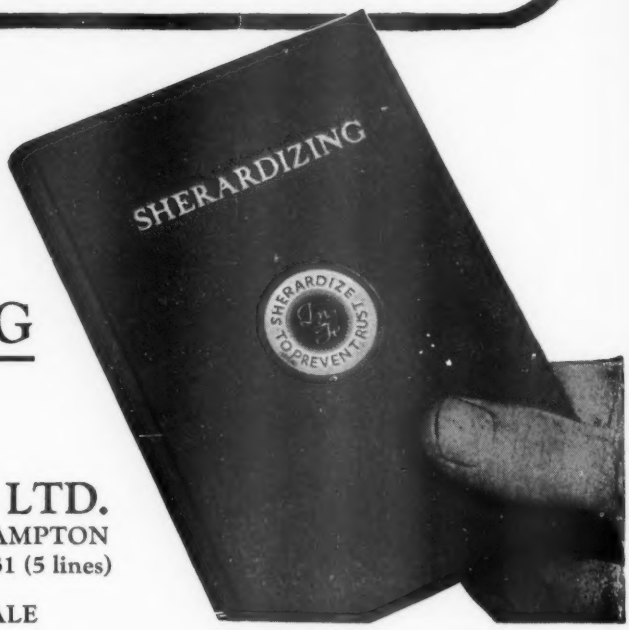

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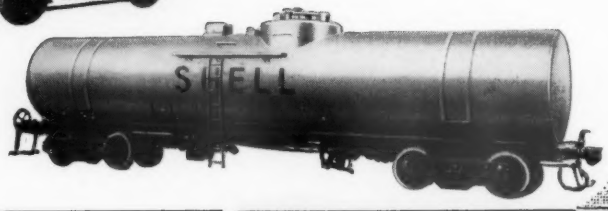

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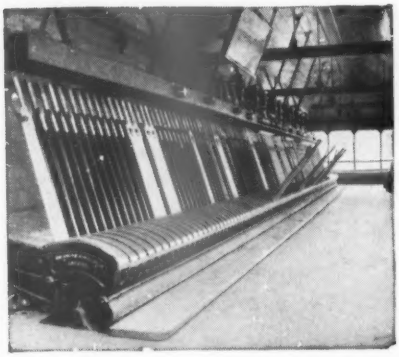

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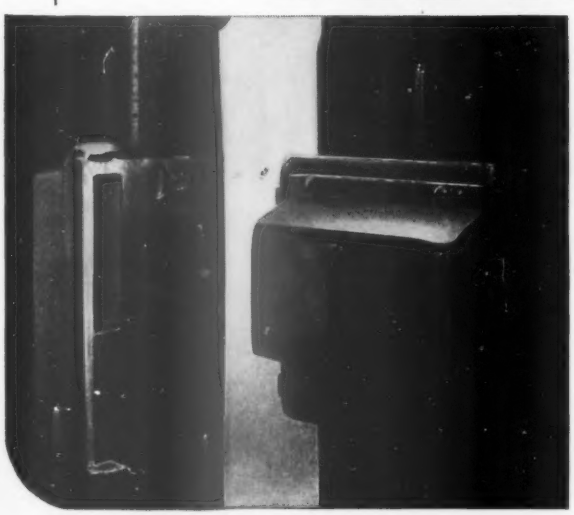

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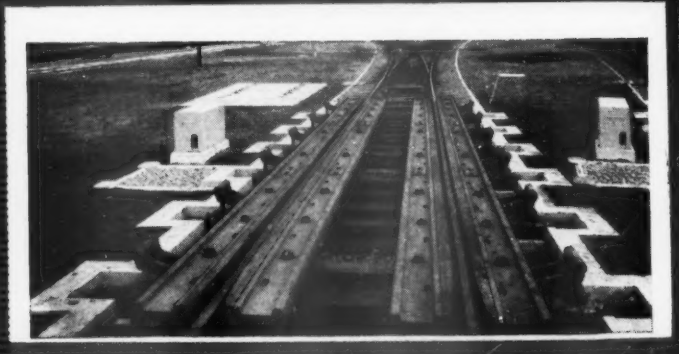

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